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Sir:

Transmitted herewith for filing is the Patent Application under Rule 53(f) of:

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For: BUILD AND OPERATE PROGRAM PROCESS FRAMEWORK AND EXECUTION

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Enclosed are:

X 23 Sheets of Informal Drawings.

____ An assignment of the invention to International Business Machines Corporation, Armonk, New York 10504.

____ A certified copy of a _____.

____ Declaration and Power of Attorney is attached to the application.

____ Associate Power of Attorney.

____ Information Disclosure Statement with form PTO-1449 with references attached.

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Respectfully submitted,

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BUILD AND OPERATE PROGRAM PROCESS FRAMEWORK AND EXECUTION

Field of the Invention

This invention relates to build and operate programs, and particularly, to a process framework for such programs and their execution.

Background of the Invention

A program is marked by its size and complexity. It may conveniently be understood as a group of related projects which are managed in a coordinated way to achieve a long-term build and operate objective.

To illustrate this important aspect, it is useful to consider what is commonly known as "the Space Program". One such current program is that to build and operate the International Space Station in Earth orbit. The program is of enormous complexity, and includes, for example, building and delivering component modules of the space station, delivering the modules to the site in space, assembling the modules, and training astronauts in the operation and maintenance of the finally assembled space station. The build and operate program aspects are distributed over many geographical sites in different countries of the world, and in space.

Another example of a program, from the commercial arena, is the creation of a global e-business providing an entirely new service, or a large corporation moving to a new business model to deliver its existing products and services to the global market using the internet and e-commerce.

A further example of a program is providing technology for a large-scale sporting event, such as the Olympic Games. The program involves building and operating the Olympic Games technology across multiple venues, each staging multiple events over multiple days. Component projects can, for example, relate to building and operating information technology infrastructure, computer application systems, and telecommunications systems, the training and deploying of staff, and defining the processes

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for the collection and dissemination of results information to the media for the duration of the sporting events.

A characteristic shared by many technology programs is the need to "fast track" the build and operate phases in order to collapse time. Fast-tracking involves the overlapping of design and development activities, and the deployment and operation of some program components while others are still in the build phase. Fast-tracking increases the complexity of a program and increases the risk of cost and schedule overruns.

A build and operate technology program incorporates a number of management disciplines, each with their own specialist methodologies or process frameworks. Three of the key disciplines are project management, technology management and process management, for each of which a number of mature and widely accepted methodologies are known. However, individually, these methodologies either do not adequately address the complexity encountered in large-scale technology programs, or they do not deal with both the build and operate phases. Mature and accepted methodologies for large technology programs do not exist, and the integration of discipline-based methodologies is difficult because of conflicts in the application of core management principles or terminology.

An example of project management methodology is the Project Management Body of Knowledge (PMBoK) published by the Project Management Institute of Four Campus Boulevard, Newtown Square, Pennsylvania 19073-3299, a worldwide certification body that certifies practitioners in project management competency.

Another example of prior art in technology management are the System Development Life Cycle (SDLC) Methodologies, produced by international IT consultancies, such as Information Engineering, Method1, Navigator and WSDDM, that focus on the build phase of Information Technology projects.

An example of a process methodology is the Capability Maturity Model (CMM) from the Software Engineering Institute (SEI) at Carnegie Mellon University in Pittsburg, USA. SEI acts as a worldwide certification body in the software engineering competency.

The focus of CMM is the build phase of software engineering projects.

Large build and operate technology programs that are undertaken without an adequate methodology or process framework are susceptible to failure for a number of reasons, the more common of which are:

- Cost and schedule overruns because of an inability to define the scope of work and contractual obligations of each sub-contractor or project team in a way which supports a fast-track approach and changing organization structures during the transition from build to operate phases.
- Cost and schedule overruns because of inadequate Cost/Schedule Control Systems (CS^2) and related processes such as deliverables management and change management.
- Conflicts between the discipline-based methodologies of sub-contractors, when the program management methodology does not provide adequate integrating mechanisms.
- An inability to perform total risk management (risk assessment, apportionment to sub-contractors, risk mitigation and contingency management).
- Missing deployment schedule dates because of difficulties coordinating the delivery and integration of components from sub-contractors.
- Missing deployment schedule dates because operational process development, staffing and logistics support schedules are not integrated with technology build activities.
- Disputes relating to the quality of deliverables by sub-contractors, particularly in relation to services, because of inadequate methods for defining, negotiating and reporting on service levels.
- Difficulty in managing the huge number of tasks/activities.
- Failure to recognise the changes in skill required from *building* to *operating*.

It is the object of the present invention to avoid or at least reduce the disadvantages in prior art and to provide a framework suited to build and operate programs.

Summary of the Invention

The invention discloses a framework for a build and operate program, comprising:

one or more build processes;

one or more operate processes;

one or more management processes; and

a plurality of links formed as outputs from said build, operate and management processes that form inputs to one or more other build, operate or management processes;

and wherein a said link has associated with it exit conditions that must be satisfied before the link can be traversed from output to input.

The invention further provides a framework for a large-scale sporting event, comprising:

a set of build processes generally followed by a set of testing processes, generally followed by a set of operations processes, generally followed by a set of game-day processes;

a set of management processes related to all of said build, testing, operations, and game-day sets of processes;

a plurality of links formed as outputs from individual build, test, operate, game-day, and management processes that form inputs to one or more other build, test, operate, game-day, and management processes; and

wherein said link has associated with it exit conditions that must be satisfied before the link can be traversed from output to input.

The invention furhter provides a method for establishing a build and operate program, comprising the steps of:

defining one or more build processes;

defining one or more operate processes;

defining one or more management processes;

forming a plurality of links as outputs from said build, operate, and management processes and inputs to one or more other build, operate, or management processes.

The invention further discloses a method for executing a build and operate program, comprising the steps of:

defining one or more build processes;

defining one or more operate processes;

defining one or more management processes;

forming a plurality of links as outputs from said build, operate, and management processes and inputs to one or more other build, operate, or management processes; and

allowing a link to be traversed from output to input in the course of executing the program only if exit conditions associated with it are satisfied.

The build processes can precede the operate processes, with an overlapping boundary therebetween such that some operate processes are able to be executed before all build processes are executed. Sequentially linked build and operate processes are assigned to one of a plurality of prescribed process streams, and links spanning across two or more process streams form planning milestones so far as the outputs represented by the link are concerned. In one form, each management process is linked only to either a build process or an operate process. The exit conditions can represent deliverable products or services that have been agreed to be provided.

The exit conditions can be determined by the steps of: beginning with an ultimate operate process, determining what requirements should be met to perform that process defining exit criteria for immediately preceding processes and continuing to progressively determine requirements for preceding processes to determine exit criteria for each said process.

The invention yet further provides a method for executing a large-scale sporting event, comprising the steps of:

defining a set of build processes generally followed by a set of testing processes, generally followed by a set of operations processes, generally followed by a set of game-day processes;

defining a set of management processes related to all of said build, testing, operations, and game-day processes;

forming a plurality of links as outputs from individual build, test, operate, game-day, and management processes; and

allowing a link to be traversed from output to input in the course of executing the program only if exit conditions associated with it are satisfied.

The invention yet further provides a method for executing a build and operate program, comprising the steps of:

determining program requirements;

defining build, operate, and management processes, and related links therebetween, based on said requirements, said links between processes only being traversable if exit conditions associated with each are satisfied; and

traversing said processes over time.

The invention yet furhter provides a method for executing a build and operate program comprising the steps of:

determining program requirements;

defining build, operate, and management processes, and related links therebetween, based on said requirements;

beginning with an ultimate operate process, considering what requirements should be met to perform that process defining exit criteria for immediately preceding processes and continuing to progressively determine requirements for preceding processes to determine exit criteria for each said process, said exit criteria required to be satisfied before a link between processes can be traversed; and

traversing said processes over time.

The invention yet further provides a method for executing a build and operate program, comprising the steps of:

beginning with an ultimate operate process, determining what requirement should be met to perform that process, defining exit criteria for immediately preceding processes, and continuing to progressively determine requirements for preceding processes to determine exit conditions for each said process, said exit criteria required to be satisfied before a link between processes can be traversed.

Brief Description of the Drawings

A number of embodiments of the invention will now be described with reference to the accompanying drawings, in which:

Fig. 1 is a schematic block diagram of a generalised build and operate program framework in accordance with the invention;

Fig. 2 is a schematic block diagram of the 'minimum set' program framework;

Fig. 3 is a schematic block diagram showing detail of staged interaction between build and operate phases;

Fig. 4 is a schematic block diagram showing link inputs and outputs in more detail;

Figs. 5A and 5B shows two flow diagrams relating to program framework definition and execution;

Fig. 6 is a schematic block diagram embodying the invention relating to an Olympic Games program;

Fig. 7 is a schematic block diagram showing sub-processes of the processes in Fig. 5;

Fig. 8 is a schematic block diagram showing underlying activities of an Olympic Games program;

Fig. 9 is a diagram showing a generalised build process and associated outputs and exit conditions;

Fig. 10 is a schematic block diagram showing staged transition from build to operate process phases;

Fig. 11 is a schematic block diagram showing the OPM methodology in a generalised manner;

Figs. 12A-12D show a Process Level Definition (PLD) diagram for the sport of Badminton;

Figs. 13 and 14 show an Activity Level Definition (ALD) diagram for two Badminton processes;

Fig. 15, 16A and 16B shows an Interprocess Level Definition (ILD) diagram for interprocess dependencies relating to Badminton;

Fig. 17 shows a global risk mitigation ALD for the Manual Report scenario;

Fig. 18 shows a global risk mitigation ALD for the Swiss Timing Interface Feed fails scenario;

Fig. 19 shows a process framework produced by the OR100 methodology; and

Fig. 20 shows a process block diagram for the SIPOC methodology.

Detailed Description Including Best Mode

Program Framework

Fig. 1 shows a generalized build and operate program framework 10 that can be applied to a program having any purpose. The framework 10 includes a plurality of build processes, B_1, B_2, B_3, ..., B_x, 20-26. Further, there are a plurality of operate processes, O_1, O_2, O_3, ..., O_y, 30-36. Finally, there are a plurality of management processes, M_1, M_2, ... M_z, 40-44. The framework 10 thus is required to have the three basic types of processes: build, operate, and management.

Each of the individual build, operate, and management processes can have relationships with one or more other processes of the same type, or of the other two types. These relationships are referred to as "links". A link forms the output from one process and the input to one or more other processes. It is thus a 1-to-n mapping between output and inputs. Links are "traversed" from output to input.

In Fig. 1, the multiple links, L_a, are indicated by the broad line 50. The multiple links, L_b between the operate processes 30-36 are indicated by the broad line 60. The multiple links, L_c, between the management processes 40-44 are indicated by the broad line 70. As noted above, links also are formed between processes of different types, and the links, L_d, between the build processes 20-26 and the operate processes 30-36 are indicated by the broad line 80. In a similar way, the links L_e, between the build processes 20-26 and the management processes 40-44 are indicated by the broad line 90. Finally, the links, L_f, between the operate processes 30-36 and the management process 40-44 are indicated by the broad line 100.

Whilst all of the multiple links within processes of the same type and between processes of the different type 50, 60, 70, 80, 90, 100 are indicated as being bi-directional (for the sake of illustration), it is to be appreciated that a link is only uni-directional, having a single output from a process and having an input to another process. Where the output from

one process serves as an input to (for example) two processes, then it is to be thought of as constituting two links.

In addition to links formed between the basic classes of build, operate and management processes, there also can be 'external' links (ie. to external stakeholders) formed. Fig. 1 also shows such links 28, 38, 48 providing inputs and outputs, to the build processes, B_x, operate processes, O_x, and management processes, M_x, respectively.

The framework 10 shown in Fig. 1 is generalized, and must be specifically configured in consideration of the specific program at hand. This will be described further below.

Fig. 2 shows a minimum set framework 10′ where there is a single build process, B_1, 20′ having input links 28′, links, L_c, 80′ with a single operate process, O_1, 30′. The operate process has a single external output link 38′. A single management process, M_1, 40′ has links, L_e, 90′ with the build process 20′, and links, L_f, 100′ with the operate process 30′.

Fig. 3 shows two build processes 20-22 having links principally with respective operate processes 30, 32. The first build process, B_1, 20 has four links 110-116 with the operate process, O_1, 30. Fig. 3 indicates that these links 110-116 are traversed at relatively different times, in what can be considered as a staged manner. In other words, the four links 110-116 that must be traversed to move from the build process 20 to the operate process 30 tend to occur at sequential points in time.

In a similar way, the second build process, B_2, 22 has three links 120-124 with the second operate process, O_2, 32. These links 120-124 also are traversed in sequence so the transition between build and operate is made in that manner.

Other links 140-144 have been shown relating to other aspects of the process interaction, and their relation in time, given that Fig. 3 broadly indicates the passage of time

in a left-to-right direction.

Fig. 4 is a schematic block diagram showing further details of a build process, B_1, 20 having links with two operate processes, O_1 and O_2, 30-32. This simplified view indicates that the link identified by the number 150 forms an output to build process 20 and an input to operate process 30. At the output of the build process 20 there is a logic block 160 that performs a test to determine whether three exit conditions 162-166 have been satisfied. The link 150 between the build process 20 and the operate process 30 can only be traversed if all three exit conditions have been satisfied. In a similar way, the link 170 from the build process 20 to the second operate process 32 can only be traversed if the logic block 180 assesses that the two indicated conditions 166 and 182 are satisfied.

It is convenient to think of "exit conditions" as being (i) "acceptance criteria", where deliverables/products are concerned, and (ii) "service level agreements", where services/tasks are concerned. This will be explained more fully below.

Establishing and Performing a Program

Fig. 5A is a flow diagram illustrating the basic methodology for performing a build and operate program.

A generic program framework is established in step 200, having build, operate, and management processes, as described above with reference to Fig. 1. In the following step (step 205), the program requirements are determined, in terms of all specified or necessary inputs and outputs. In step 210, the framework is then configured to meet the requirements by establishing links between processes and exit conditions that apply to each link. Once so configured, the framework is then traversed, in step 215, in the sense that with time process exit conditions are satisfied and a link may validly be traversed. Thus the program framework can be considered as spreading, generally, from build through to operate as links are able to be traversed.

Fig. 5B shows alternate broad process steps that are undertaken in establishing and performing a build and operate program in another embodiment. Steps in common with Fig. 5A have like reference numerals.

A generic program framework 10 is established (step 200) having build, operate, and management processes as described above with reference to Fig. 1. It is then necessary, in step 220, to configure the program requirements, including links between the specific processes. Typically this is performed by bringing together a number of stakeholders to consider all possible inputs to, and outputs from the program, together with all specified or required deliverables or products and service (ie. outputs).

In step 225, each process, or linked process stream, is considered from the point of view of its criticality to the program. Criticality takes into account in known or assessed risk factors and quality considerations. The step of ascribing processes to criticality classes generally means that more project time is allocated to processes that involve high degrees of risk or more demanding levels of quality. The consideration of risk and quality in the definition of program processes obviates the need to consider risk and quality as functions of individual tasks, as is known in the prior art. Depending upon the decided rating, the process is ascribed to a specific class.

In step 230, a negotiation takes place to define specific outputs from each process, providing inputs to a linked process or processes. Subsequently, an individual process owner is assigned to each process (step 235). The idea of responsibility for processes being ascribed to individual persons is a feature of the invention that differs from the prior art. One incident of ascribing owners to processes is that each such person then also owns the risk, and must plan, manage and report on that risk. This onus has the effect of decreasing the likelihood that critical processes will fail for want of attention.

In step 240, the processes have a respective methodology, determined by their criticality class, applied to them to determine the exit conditions that apply (remembering that

the links and outputs between processes have already been defined). As it would be expected, those processes in the class having the greatest criticality will have, on average, the greatest number of exit conditions applying.

Now that the framework has been fully populated (in terms of the definition of processes, links, outputs and exit conditions), the discrete outputs are entered into a scheduling tool (step 245) so that tasks can be planned in time, and then followed. Certain sets of links and exit conditions are grouped to form milestones which are used to assist in monitoring the execution of the program. This will be described in further detail presently.

The configured framework thus can now be traversed to execute the program (step 215), with status reports against milestones providing the primary schedule control mechanism.

The broad steps relating to performance of a build and operate program as described above will now be further described with reference to a specific example, namely that of staging an Olympic Games.

Olympic Games Example

To place the size of the program that constitutes the Olympic Games in perspective, it is useful to mention certain statistics concerning the Year 2000 Olympic Games held in Sydney, Australia. About 10,300 athletes will be competing overall. There are 28 sports conducted over 640 morning, afternoon and evening sessions at 30 venues. In addition to the athletes, there are 5,100 officials, 50,000 volunteer workers, and 12,000 accredited media. The broadcast audience is estimated at 3.5 billion. The main stadium, at which Athletics is conducted, has a capacity of 110,000 spectators.

In terms of computing and telecommunications resources, 80 IBM MQ series servers and 3 IBM S/390 mainframes are deployed. Additionally, there will be 17,000 desktop and portable computing devices in use, as well as numerous other peripheral devices such as

printers, validators and displays. An estimated 13 million lines of program code was written to implement all the necessary applications.

Fig. 6 is a high level representation of the build, operate, and management processes. This level of process definition has partial correspondence with step 210 in Fig. 5A and step 220 in Fig. 5B. As shown in Fig. 6, there are two basic build process stages 20, 22, called "Build Processes" and "Testing Processes". These processes 20, 22 are related as essentially sequential blocks. The links between processes have not been shown for clarity purposes.

A first operations processes 30 follows the testing processes 22. There are two broad management processes, the first being a Program and Business Management Processes 40, the second being a Cross-Project Technical Management Processes 42. These two management processes 40, 42 will have links across the build processes 20, testing processes 22, and operations processes 30.

The particular circumstances of this Olympics program are that there is one principal contractor responsible for the building processes and some of the operations processes, and the management processes associated with those. There are a number of sub-contractors involved in various of the build processes. There is additionally a governmental Organising Committee ("OC") sharing some of the management processes and the operations processes. Such a distribution of ownership may not be adopted in future Olympic Games. The distribution of ownership could be arranged such that there was a single party having total responsibility, or many more than two principal parties having ownership. The program framework of the present invention can accommodate such a range of ownership because of the deterministic nature of the individual processes ownership and exit conditions that allow a link therebetween to be traversed, whereas prior art arrangements would be found deficient if such complexity in ownership were present.

The second operations process is the Games Processes 32. These processes 32 have links with the Organising Committee Games Processes 34, and both of those operations

processes are influenced by the OC Management Processes 44 and the OC Technology Processes 46.

It is to be understood that while the build and operate processes are shown as being generally sequential in time, there is, in fact, considerable overlap, in that some operate processes begin before all build processes are completed. The analogy is that the framework is traversed in a spreading nature, rather than a strict sequence.

Fig. 7 shows, in the next level of detail, component processes within the generalised processes shown in Fig. 6. The first build processes 20 are constituted by Requirements Baseline processes 20-1 and Architecture Baseline processes 20-2, which each have links to the Build Solution Components processes 20-3. There are eight program and business management processes, and eight cross-project technical management processes, most of which operate across all build and processes.

The program and business management processes 40 are named in Fig. 7 and designated 40-1 to 40-8. Similarly for the cross-project technical management processes 42, designated 42-1 to 42-8. There can be lower level or management sub-processes that link with individual build or operate processes, although these are not shown in Fig. 7.

The build processes 22 comprise of three groups of processes. The first is the Workforce and Training processes 22-1. Additionally, there is the Testing processes 22-2 and the Device Configuration and Logistics processes 22-3.

The operations processes 30 comprise a plurality of Stage Sports Events processes $30\text{-}1_n$, a plurality of Operate Venues processes $30\text{-}2_n$, and a plurality of Operate TCC and Datacentres processes $30\text{-}3_n$.

Fig. 8 is at the individual process level, showing processes and their linkages, within the build processes phase 20, testing processes phase 22, and operations processes phase 30.

As such, it equates broadly to step 210 in Fig. 5A and specifically to step 220 in Fig. 5B. For clarity, links with the Program and Business Management processes 40 and the Cross-project Technical Management processes 42 have been omitted. Each link constitutes an output from a process and an input to another process. In fact, a single link may represent multiple outputs (which otherwise are omitted for the sake of clarity).

A representative listing of the build, operate and management processes created for the Sydney Olympics is shown in the following Tables:

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Customer Relationship Management	Project Establish-ment	Management System	Contract Performance Management	Finance & Admin Manage-ment	Contract & Risk Manage-ment	Resource Manage-ment	Program Operations Infrastructure Management
P10 Customer Satisfaction & Expectation Mgt	P15 Organisation Definition	P18 Project Management Plan (PMP)	P11 Customer Performance Reviews	P32 Finance Mgmt	P20 Risk Mgmt	P09 Sub-Contractor Management	P57 Performance & Service Level Monitoring & Reporting
P06a Customer Deliverables Mgt P14 Project Issue & Action Mgt	P16 Project Process Framework	P25 Process Management	P49 Internal Project Performance Reviews	P33 Procure-ment	P37 Contract Mgmt	P31 HR Management	P58 Develop & Maintain SLAs
P63 SOCOG Policy Submission & Review	P17 Master Schedule & Contract Calendar	P111 Process Analysis & Planning	P98 Post Event/Imple-mentation Reviews	P34 Asset Mgmt		P35 Skills Management & Training	P60 Operations Support & TCC Planning
	P38 Commun-ication		P99 Client (IF) Acceptance	P39		P54 Logistics Management	P140 Operations Infrastructure Planning & Design

Table 1: Program & Business Management Processes

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Project Management & Control	Project Support & Administration	Configuration & Change Management	Solution Engineering & Integration	Solution/ Quality Assurance	Service Requests	Support & Problem Management	Service Delivery & Operations Management
P01 Sub-Project Detailed Planning	P30 Sub-Project Support & PMO	P21 Change Management	P05 Architecture Baseline Management	P24 Quality Mgtmt	P55 Service Requests	P52 Problem Management	P12 Service Delivery & Operations Mgtmt
P02	P28 Document	P22	P04 Solution	P06		P64	P56 Operations

Sub-Project Tracking & Status Reporting	Management	Configuration Management	Technical & Engineering Mgt	Deliverables Mgtmt		Operations Change Management	Systems & Tools
P13 Sub-Project Issue & Action Management	P29 Sub-Project Records Mgt & SPCBs		P40 E2E Solution Delivery Process & Methods	P26 Software Delivery Mgmt		P65 Operations Support Management	
				P27 Software Detect Mgmt			

Table 2: Cross-Project Technical Management Processes

Workforce Stream	**Process Stream**	**Application Development Stream**	**Venues Stream**	**Infrastructure Stream**	**Device Configuration & Logistics Stream**	**Operations Stream**
P100 Workforce Management	P03 Requirements Baseline Mgmt	P05 Architecture Baseline Management	P130 Venue Planning & Design	P140 Operations Infrastructure Planning & Design	P59 Device/Logistics Planning & Process Analysis	P60 Operations Support & TCC Planning
P101 Workforce Planning	P16 Project Process Framework	P120 Application Design	P131 Venue Process Analysis & Develop-ment	P142 Operations Infrastructure Build & Test	P71 Device Build & Configuration	P61 Operations Process Analysis & Development
P102 Workforce Deployment	Application Owner	P121 Application Build	P132 Venue Build & Test		P73 Device/System Deployment & Logistics	P65 Perform Operations Support
	P90 Application Support	P122 Application Maintenance				
	P111 Process Analysis & Planning	P123 Application Integration Test				

P103 Volunteer Motivation	P112 Procedures Developmen t					
Training Stream	**Event Planning & Assurance Stream**	**Test Stream**	**Software Delivery & Distribu-tio n Stream**			
P105 Workforce Training Management	P98 Post Event/Imple mentation Review	P124 Delivery Verification Test	P26 Software Delivery			
P106 Workforce Training Planning	P99 Client (IF) Acceptance Test	P125 Event Test Planning & Preparation	P74 Software Control & Distribution			
P107 Training Course	P115 Plan & Manage Test Events	P127 Systems Focus Test				
P108 Training Delivery	P116 Plan & Manage Rehearsals	P128 Process Test				
		P129 User Acceptance Test (GMS, INFO, WNPA etc).				

Table 3: (Partial) Build and Operate Processes

Customer Relationship Management	Run the Games (Technology)	Manage the DCF	Manage Venues	Operate Extended TCC	TCC Mgtmt & Administration	Operations Manage-ment	Application Support
P08 Hosting/ Hospitality	P38 Communicate with all Stakeholders	In the TCC P70 Manage the DCF	In the TCC P80 Manage & Support VITMs	P23 Games-Tim e Test Mgmt	P44 Technology Partner Interface Mgmt	P12 Service Delivery & Operations Mgmt	P90 Application Management & Support
P10 Customer Satisfaction &	P47 Games Operations	In the DCF P22	For each Venue	P75 Datacentre	P49 Internal Project Perf.	P45 Data Quality	P91 Application

Expectation Management	Reporting	Configuration Mgmt	P76 Perform Venue Operat-ions Continuity Mgmt	Disaster Recovery	Reviews	Control	User Processes
P14 Issue & Action Management	P50 Technology Command & Control	P41 Device Asset Mgmt	P81 Operate Non-TCC Venues	P77 Switch to DR Site	P52 Problem Management	P65 Perform Operations Support	P92 Application Operation
	P53 Critical Situation Management	P72 Deliver Mainten-ance		P86 Datacentre Mgmt	P54 Logistics Management	P83 Systems & Technology	
	P66 Games-Time Planning & Coordination	P73 Device/ System Deployment & Logistics			P55 Service Requests	P84 Network Management	
	P67 Reporting to IBM HQ	P74 Software Control & Distribution			P57 Performance & Service Level Monitoring & Reporting	P85 Provide Interface to Internet	
					P64 Operations Change Mgmt	P89 Data Management & DBA	
					P68 Shift Rostering		
					P69 TCC Administration		
					P82 Facilities & Equipment Mgmt		
					P87 Backup & Recovery		
					P88 Security Management		
					P91 Run TCC Applications		
					P100 Workforce		

					Management		
					P102 Workforce Deployment		

Table 4: (Partial) Operate Processes

Process Outputs

Fig. 9 is an expanded view of the "Results Process Analysis & Planning" (RPAP) process 250 shown highlighted in Fig. 8 showing its agreed outputs and exit conditions.

The input links to the RPAP process 250 are on a 'per sport' basis. That is, the process has, for the Olympic Games, twenty-three sets of inputs and corresponding outputs. Considered then on a per sport basis, the inputs are:

(i) complete requirements documents,
(ii) venue design,
(iii) venue build plan,
(iv) Sport Federation Rule Book, and
(v) expert knowlege.

Items (i) to (iii) are signified as being "entry criteria", which is intended to mean that each has complied with an agreed program template, and has been accepted by the Program Technical Review Panel. This is really the same thing as having satisfied exit criteria from the respective preceding process (ie. Venue Planning & Design 255, and Requirements Baseline 260).

The outputs (ie. 'deliverables') in this instance are:

(i) process level descriptions
(ii) activity level description, and

(iii) process development & test plan.

The "exit criteria" for each output are, as it happens, the same as the "entry criteria" mentioned above.

Traversing the Framework (Executing the Program)

Fig. 10 is a conceptualised representation that demonstrates the staged transition between build and operate phases.

In Figs. 6, 7 and 8, the boundary between build and operate phases is shown as discrete, and implies that it occurs in a single point in time. In actuality, the boundary is rather that represented in Fig. 10, where there is a staged transition, in that, as noted above, many operate processes begin before all build processes are completed.

In a temporal sense, some operate processes will commence during a time that is principally concerned with testing processes, and even earlier than build processes. The transition between build and operate concludes with the completion of all build processes, and for the present example, is at a point in time 100 days prior to opening of the Olympics (the "100 Day Operational Readiness phase").

Referring then to the operations processes phase shown in Fig. 10, it can be seen that there are various "peaks" that occur during time. These correspond with scheduled Test Events, where there is a staged operations rehearsal. With each subsequent such rehearsal, a greater proportion of the total Olympics operations processes are practised.

Fig. 10 also shows how some program management process occur only in the build or the operate phase, whereas others occur in both. The three processes (P37, P06 and P27) listed on the left-hand side occur only in the build phase. The three process (P64, P58 and P58) listed on the right-hand side occur only in the operate phase. The four (management) processes (P28, P21, P60, P22) shown along the bottom occur in both phases. However,

because of the gradual transition from build to operate, all may be operating at the same points in time. This arrangement is designed to clarify to build and operate teams the correct process to use for problem and change management depending whether the component is in the build or operate environment (ie. P37 is broadly equivalent to P64, P06 to P58, and P27 to P52).

Process Assurance Classes

As described with reference to step 215 of Fig. 5, once the links and outputs between individual processes have been established, it is necessary to determine the assurance level of individual processes and describe each to an appropriate class. In the present example, four classes are utilized, as follows (in order of most critical to least critical):

Assurance Class	Methodology
A	OPM
B	OR100
C	SIPOC
D	Manual

Table 5

The allocation of assurance class is performed objectively, and takes into account program deliverables in terms of products and services and an assessment of risk and quality assurance at a macro level. This assessment will necessarily include a consideration of contract obligations as a starting point.

Category A processes are those that are mission critical, where failure would have a major impact. Such processes require formal Failure Mode Critical Analysis and risk mitigation.

Category B processes are those that require a formal service level agreement.

Category C processes are those involving multiple teams and where entry and exit criteria, and scheduling milestones, need to be explicitly defined.

Category D processes are those involving a single team which has the experience to manage the risk associated with the process.

A. OPM

The acronym OPM stands for Olympic Process Methodology. The methodology is known *per se*. This name is chosen for convenience, and it is to be understood that the methodology is not restricted only to use in the context of an Olympic Games.

For the purpose of illustration, the example given refers to the Results Process Analysis & Planning process 250 shown in Fig. 8. This process has as its outputs the documents shown in Fig. 9, for convenience known collectively as Process Analysis Documents (PADs) - one for each sport. PADs are developed taking into account Failure Mode Criticality Analysis then risk mitigation, and in this way seek to maximise the ability to detect problems and minimise the negative impact and cost by recognizing problems before they occur.

For the purpose of explanation, the sport of Badminton will now be considered.

Referring then to Fig. 11, the knowledge and information previously gathered (see also Fig. 9), in step 300, is input to a process level definition process, in step 302.

Fig. 12A shows the basic sequence of events for Badminton. The phases are pre-competition 320, competition 322-326, and end-of-competition 328. Figs. 12B-12E show this sequence in greater detail, in the form of Process Level Definitions (PLDs), with the process steps 340-374 being self-explanatory. During this step the knowledge and information obtained/gathered in step 300 is critically analysed to determine general areas of risk. In addition typical sport exception scenarios would be created which have been known

to cause system failures in the past. Notes are made of these risk areas and potential risk mitigation strategies. At this point, target acceptable risk levels are agreed, based upon process criticality. This is described below as the assignment of Risk Factors (RFs).

In step 304, the Activity Level Definition process occurs. The initial definition similarly takes into account the risk areas, critical analysis and potential risk mitigation strategies identified in step 302. The completed ALD is then subjected to a formal criticality analysis (step 306) followed by risk mitigation (step 308). Fig. 13 shows the Badminton ALD for the "Event Configuration" process 340.

For the purposes of the PAD (which includes the PLD and related ALD), the following identification scheme has been adopted, which is used in the ALD specifically to show dependencies.

Name of ALD	PAD##	Description of ALD
Event Configuration	aa-ECF	Check Event Configuration and OEQ transfer
After Entries Deadline	ab-AED	Check OEQ download data, verifies and updates
Late Change request	ba-LCR	Requests late change, verifies and approve results
Before the Draw	ca-BTD	Print for Control reports Entry List and distributes Pre-Draw Reports
During the Draw	da-DTD	Conduct Draw and assist with Draw
After the Draw	ea-ATD	Receive Draw List, Print for Control Draw Results
Draw Press Conference	fa-DPC	Preparation for Competition Reports
Midday before Competition	ga-MBC	Preparation for Court Assignments
Start of Day	ha-SOD	Start Badmington Application ready for Event
Start of Session	ia-SOS	Preparations for Official Assignments
Before the Match	ja-BTM	Entering finished starting line up
Start of Game	ka-SOG	Record start of game

Duration of Game	la-DTG	Initiate play by play
End of Match	ma-EOM	Verification of scoresheet and checking
End of Session	na-EOS	Generate match report to preparation for playing assignments and schedules
End of Day	oa-EOD	Discusses End of Day day by day activities and results
Medal Presentation	pa-MDP	Print for Control for Medal Presentation

Table 6

Referring to the first sub-process 380, the symbol used is in two halves. The upper half indicates the sub-process owner, in this case the Results Manager. The lower half represents a unique task number ("aa-ECF-01") and a written description: "Ensure results system is operational". The output of the sub-process is expressed as four variables: trigger, timeframe, frequency, and mode. In this example, the trigger (ie. for the next sub-process) is 'results system operational', the timeframe is 5 minutes (ie. hh:mm:ss format), the frequency is one time ("1x"), and the mode is 'manual'.

Referring to sub-process no. 382, it can be seen that the sequence includes decision elements. Here, it is asked "Is configuration correct?", and a branching occurs depending upon the answer 'yes' or 'no'.

Fig. 14 shows a further example, in this case the Badminton ALD for the "Start of Day" process 356. Referring to sub-process no. 382, it can be noted that the decision element that has three inputs. This exemplifies that multiple inputs can exist.

The ALD can also indicate deliverables (not shown in these examples), such as printed reports or data feeds to other related processes, such as television broadcasting.

Referring now to Fig. 11 again, in step 310, Interprocess Level definitions (ILDs) are

prepared. Their purpose is to define interprocess dependencies, and are useful as a management tool, but also in assessing criticality of the interfaces between processes.

For the sport of Badminton there are forty-six different process owners. With such a large number of actors it becomes difficult to appreciate criticality in a meaningful way without some formal mechanism. This information is provided by the ILDs. Fig. 15 shows a portion of the ILD for Badminton, representing the relevant process responsibilities of the "Internet Results Team", the "INFO Application Team", the "Gateway Operators", the "International Federation", the "International Broadcast Centre", and the "Main Press Centre". The potential risk can be easily assessed (in part) by the number of sub-processes owned by each actor. In this case, the critical service levels for the process are determined by the International Federation. When this process is critically analysed, of the forty-six actors, the one with the most critical sub-processes is the Event Manager (EM), which is shown in Figs. 16A and 16B.

Once the ALDs are identified, a further failure mode criticality analysis review (step 306) is conducted to determine which of the activities have the higher risk of failure. Clearly this involves the analysis of the ILDs, as just described. One component of such a review is to determine Risk Factors and assess whether they meet the agreed RF level.

Risk mitigation strategies (step 308) are then devised to mitigate these risks (i.e. to reduce individual activity (and process) RFs), and the ALDs (and PLDs) are modified accordingly.

The risk mitigation analysis includes three steps:

1. Explore options to mitigate risk
2. Implement changes to process, activity or inter process dependencies
3. Reassess that the final risk of the process, activity or inter process dependencies is below the agreed "RF" level (normally RF2 or RF3)

In relation to the assignment of Risk Factors, a ten level scale is adopted:

RF#	Assessment given to each level of risk
RF1	multiple alternate paths extremely low risk
RF2	alternate paths available, very low risk
RF3	failure is possible, some risk
RF4	failure is very possible, moderate risk
RF5	failure is very possible & likely
RF6	failure is probable, risk is moderately high
RF7	failure is probable & likely, risk is high
RF8	failure is very probable & likely, risk is very high
RF9	failure is almost definite, risk is extreme
RF10	definite failure, unacceptable results

Table 7

These risk factors assist in determination of the critical activities within the process.

The criteria for the assignment of RFs, in this example, are:

- Are processes fully defined, including dependencies?
- Are there any existing alternative paths?
- What is the risk of failure?
- In the event of failure, how quickly does recovery occur?

For each of RF1-RF10, the criteria are:

RF1

- fully defined processes, mostly defined dependencies
- no existing multiple alternate paths result in failure
- existing problems within the activity, process, interprocesses have been resolved

successfully

RF2

- fully defined processes, some undefined dependencies, but no unknowns
- no existing alternate paths result in failure
- very low risk of failure is seen within the activity, process, or inter process
- if failure of the activity, process or inter process occurs, recovery is immediate and successful

RF3

- fully defined processes, undefined dependencies, some unknowns
- an alternate path can lead to failure (but highly unlikely)
- low risk of failure is seen within the activity, process, or inter process
- if failure of the activity, process, or inter process occurs, recovery is almost immediate, and mostly successful

RF4

- partially defined processes, undefined dependencies, many unknowns
- alternate paths can lead to failure (and likely to occur)
- moderate high risk of failure is seen within the activity, process, or inter process
- if failure of the activity, process, or inter process occurs, recovery is not immediate, and is moderately successful

RF5

- some undefined processes, undefined dependencies, many unknowns
- no alternate paths or alternate paths that lead to failure
- risk of failure is seen to be as likely within the activity, process or inter process as success
- if failure of the activity, process, or inter process occurs, recovery is not immediate, and is not always successful.

RF6

- a moderate number of undefined processes, undefined dependencies, many unknowns
- single dependencies that can fail
- risk is seen to be more likely to fail within the activity, process, or inter process than success
- if failure of the activity, process, or inter process occurs, recovery is not immediate, and is not successful

RF7

- a high number of undefined processes, undefined dependencies, many unknowns
- single dependencies that can fail, and are likely to fail
- failure is much more likely to occur than success
- if failure of the activity, process, or inter process occurs, no recovery or recovery is not immediate, and is not successful

RF8

- much of the process is undefined, with many unknowns
- definite single dependencies that will fail due to large numbers of unknowns
- failure is the probable path for the process
- when failure of the activity, process, or inter process occurs no recovery is available

RF9

- most of the process is undefined, with many unknowns
- multiple single dependencies that will fail due to large numbers of unknowns
- failure is the most likely path for the process
- when failure of the activity, process, or inter process occurs, no recovery is available

RF10

- the process is undefined, with many unknowns

- undefined multiple single dependencies that will fail due to large numbers of unknowns
- failure is the only path for the process

In exploring alternate paths, various ways of reducing the risk for each critical activity are considered. Changes are then implemented in order to achieve the reduction in risk. Finally, any change is assessed to determine whether it can successfully fit within the existing PLD or ALD. This mitigation thus can be seen as operating iteratively until a satisfactory RF# is achieved for each individual process, activity, or inter process dependencies. That is, for any activity, process or inter process dependencies, if a mitigation is worked, have the criteria, and thus the RF# reduced? If so, is the new RF# acceptable? If not, then perform another mitigation.

Figs. 17 and 18 show alternate paths developed to mitigate an identified RF level that is too high. The mitigation strategies can be to devise one or more alternative paths, to reach a position of no unknown or undefined dependencies, or reduce recovery time.

For a process that has as an output the production of a report (e.g. process 384 in Fig. 14), a mitigation is to devise an alternative path, such as shown in Fig. 17. That is, the risk mitigation strategy is implemented at any time the Print Distribution Team has not received a report when such should have occurred (typically at the end of a match, end of a session, or end of a day). This is represented by sub-process no. 390. The sequential sub-processes are followed until the output of the report being delivered is satisfied.

For a process that has as a dependency a timing feed from a third party, (not specifically shown), one such mitigation is to devise an alternative path, such as shown in Fig. 18. This risk mitigation is implemented at any time that the Results System Manager (RSM) detects that the feed from Swiss Timing has failed, represented by sub-process no. 396.

B. OR100

This methodology is known as Operational Readiness 100, and refers to the principle that all build processes need to be completed such that there is operational readiness 100 days before commencement of the Olympic Games.

The underlying idea of OR100 is to determine what deliverables or service levels are required for each process to be operationally ready, and working backwards from that point to establish preceding processes, links and exit criteria. In other words, the program framework is constructed from "right-to-left".

Fig. 19 represents a process framework culminating in the 'Support the INTEL™ Base' process 400, numbered P693. The outputs for P693 are to provide and support devices at the Technology Command Centre and other venues, configured for each one's specific use. Many of the outputs are services and for these, service level agreements would be prepared.

In order to achieve that level of operational readiness, the 'inputs' to process 693 are:

- the provision of quality management
- management of the inventory of devices
- set up of Device Configuration Facility
- management of staff on a day-to-day basis
- ensure adequate supply of parts
- perform build of devices
- ensure replacement or fixing of failed devices
- unpack and install devices at venue
- install 'Golden Code' on devices
- retrieve devices after Test Events or completion of Games
- maintain platform software

Having determined these 'inputs' dictates corresponding processes be defined,

identified in Fig. 19, by the reference numerals 402-422.

The exit criteria for each of these processes are then determined, and are as follows:

P024DCF: *QA CHECKS: Performed QA checks as documented in P3 during build phase. *M47 PASS: Passed milestone checks. *CHANGE CONTROL: Installed devices are under change control

P041: *INVENTORY SYSTEM: System in place showing location and status of all IBM devices. *COMPETENT STAFF: Staff to operate the system have been using the system for 6 months.

P059: *DOCUMENTED PLAN: The plan for deployment shows location of all Games time devices. *DEPLOYMENT PLAN: Delivery of all devices required for TR 1 accomplished.

P068DCF: *STAFF ROSTERS COMPLETE and stall members informed on their place and time of duty. *STANDBY LISTS COMPLETE, including telephone numbers and times of availability. *TRANSPORT available for standby staff. *WORKFORCE DATABASE complete and available. *POLICIES in place covering working hours, sick leave, etc. *STAFF AND VOLUNTEERS TRAINED and passed competency test.

P070C: *AUDIT TRAIL: Documented audit trail of devices installed available. *PARTS DEPLOYMENT DETAILS: Parts deployed according to PSS plan.

P071: *DOCUMENTED BUILD PLAN: Documented build plan in place and available for review. *STAFF: Staff identified to match build plan. *DEPLOYED SERVERS: Servers in place for deployment of software.

P072DCF: *Documented procedures for fix vs replacement.

P073c: *VISIBLE INSTALLED DEVICES: Installed devices visible at

TCC. *DEVICE CHECK: Devices provided up and passed installation check. *DEPLOYMENT PLAN: Deployment plan documented for install teams.

P074: *TIVOLI CODE: Code available on Tivoli servers. *DOCUMENTED PLAN: Documented plan for software deployment.

P078: *DOCUMENTED PLAN: Documented bump-out plan available for review. *STAFF SCHEDULE: Staff schedule to perform device retrieval documented.

P093: *CID SERVERS: CID servers deployed. *STAFF: Competent staff to carry out deployment have exercised the build for 6 months. *VOLUNTEERS: Volunteers with third year attributes.

The process framework continues to be developed from right-to-left, in the sense that 'inputs' to each of the processes 402-422 are determined.

The following inputs are then defined:

P059: *Venue accreditation for transport drivers. *Adequate transport capability. *Venue access restricted.

P068DCF: *Plans for PSS approved

P07c: *PSS plan based on device MTBF.

P071: *Complete BoMs from VITMs. *BOMs reviewed for QA. *Operating system software frozen. *Base subsystem components availabe.

P073c: *DOT plan. *Availability of volunteers. *Volunteers not present when rostered.

P074 *Definition of approved code. *Person authorised to provide code approval. *INFO and CIS not frozen.

P078: *Volunteer attendance when required.

P093: *Training of volunteers. *Platform software supported by specialists and handed over to DCF.

This, in turn, dictates earlier processes, shown as process 430-448.

The methodology continues until at ultimate inputs are defined, thus completing the framework in terms of processes, links, and exit criteria.

C. SIPOC™

This methodology is known per se, and is termed " Suppliers, Inputs, Process, Outputs, Customers (SIPOC™).

The methodology identifies discrete actors, in the form, working from right to left of Fig. 20, of customers 508 having specific requirements and receiving outputs 506 in response thereto. In turn, the outputs specify requirements to, and receive from the process 504. Furthermore the process requirements are specified to the inputs 502 which also feeds the process 504. Finally, suppliers 500 provide specified goods and/or services to the inputs 502.

By adopting such a model it is possible to define inputs and outputs for individual processes. SIPOC™ thus is underpinned by the need to determine what products and/or services are to be delivered.

The Daily Progress Reporting process (P155) is one example for which SIPOC™ is implemented. The objectives of this process is to keep its customers informed at the end of each day of the operation of technology supporting the Olympic Games (ie. operations phase). Following the SIPOC™ methodology, the following processes are established.

Suppliers	Inputs	Process	Outputs	Customers
Process Owner Venue Data Sources-various Process Owner via	Input Criteria Sheet Venus Information Items that match the Input Criteria	Source Author Input - normal operation	Completed Daily Report Input Form (form will specify any metrics that have	Captain - using generic Notes ID

Notes Administrator " "	Daily Report Input Form (Notes Stationery Item) Reporting Deadlines Contact & Distribution List	Source Author Input - contingency (to be defined), will involve fax, email by mobile phone, verbal by telephone	to be submitted)	Archive Database - using generic Notes ID
Process Owner Source Author Process Owner via Notes Administrator " "	Input Criteria Sheet Completed Daily Report Input Form Input Form - Captain's version Reporting Deadlines Contact & Distribution List	Captain's Brief - normal operation Captains Brief - contingency, to be defined, as above	Completed Captain's Briefs, by email (for each Information Area x 6) note - the Technology Captain's Report will contain a large number of metrics	Information Officer - using generic Notes ID Archive Database - using generate Noted ID
Information Officer - Metrics Information Captains	Lotus 123 Metrics Spreadsheets Captain's Brief, containing the required metrics	Prepare Daily Report Metrics	Updated 123 Spreadsheets in database Graphics derived from 123 Spreadsheet	Information Officers
Process Owner Captain Process Owner via Notes Administrator " Information Officer - Metrics	Input Criteria Sheet Captain's Brief Final Daily Report Form Reporting Deadlines Contact & Distribution List Daily Report Metrics & Graphics	Produce & Publish Daily Report (load in database and mark as "Private") Print hard copy and hand carry to IBM Games Exec for approval Approval by IBM Games (Approval) Exec Direct Distribute Hard Copy Reports to nominated recipients Mark approved report as "Public" in database Produce Daily Report - contingency, to be defined	Non-confidential Report Confidential Report Olympic Client Summary Report (distribution to be defined) 3 x reports approved Hard Copy Reports	Reports Database -Staff Reports Database - Management (database subject to regular backup by operations) (no database replication planned at this stage) Nominated IBM (Audience) Execs Other IBM (Audience) Executives and their staffs
Process Owner	Information Sources Reporting Requirements of Report Recipients Management Team & Marketing views of Information Sensitivity	Maintain Report Formats & Input Criteria	Report Formats (as Notes Stationery Items) - Author Input - Captain's Brief - DPR Input Criteria - Author Input - Captain's Brief - DPR	Authors Captains Information Officers " " "
Process Owner	Participent &	DPR Communication	Communication	IBM (Audience)

	End-user Communication & Training Needs	& Training	Materials and Events aimed at IBM Management Training Materials and Training Delivered to participants as per agreed training needs (the end product of this activity is trained process participants and execs who understand how to access reports)	Executives and their staffs Process Participants
Process Owner	Notes Administrator Requirements for Database, Mail Groups, user access etc Help Desk Number and Escalation Charts	Notes Administration & Support	Operational Notes Databases, with Access Control Lists, Input Forms etc Report Distribution & Mailing Lists End User Support	Process Participants IBM (Audience) Executives and their staffs
Process Owner VITM	Infrastructure Requirements Statement Changes to Venue Bill of Materials or Layout	Infrastructure Capacity Management, Operations & Support	DPR Infrastructure Implementation Plan Operation DPR Notes Infrastructure & Environment Updated Venue Bill of Materials	Operations Sub-Project

Table 8

As a further step, an analysis of critical customer requirements can be performed, with reference to Inputs, Process and Outputs, such that a description of the requirement can be made, a target/measure ascribed, and an impact assessed in that is not met.

Furthermore, all inter-process dependencies can be defined in terms of the related process's identity, a description of the dependency, a timing or trigger, and a frequency or volume.

Finally, milestones are allocated in terms of a "date required". For the present example, these includes:

Item	Responsibility for Action	Date Required
Infrastructure Requirements Specification & Implementation Plan	(person)	(date)
Identify and finalise changes to Venue Equipment & Facilities	(person)	(date)
Agree/finalise source data input criteria and report formats	(person)	(date)
Prepare Metric spreadsheets and graphic output formats	(person)	(date)
Finalise reporting deadlines and distribution lists	(person)	(date)
Notes Administration & Support capability in place	(person)	(date)
Databases and Email Ids created	(person)	(date)
Performance testing complete	(person)	(date)
Process Test & Training complete	(person)	(date)
Staffing Plan for Cluster Test Event	(person)	(date)
Final training for Cluster Test Event	(person)	(date)
Cluster Test Event – DPR in production	(person)	(date)
Debrief, lessons learned and process improvement plan	(person)	(date)

Table 9

D. Manual

This methodology refers only to the need for there to be a protocol or document setting out process inputs, outputs, any exit criteria, and dependencies.

Referring again to Fig. 8, the processes being ascribed the relevant criticality categories (ie. A, B, and C) have been indicated. Typically, category D is applied to certain management processes.

Event Planning Milestones & Dependencies

Once the program framework has been established, it is traversed to execute the program. An essential function of program management is Schedule Control. When all outputs have been defined, process owners are required to translate process outputs into a time schedule. In this way time dependencies of the completion of each process can be identified. The use of task activity charts, and the like, is well known, however, the present invention takes the approach of identifying a subset of all task activities (specifically those that equate to the output of each process) and allocating milestones to process outputs that cut-across defined process streams. For Schedule control within a project, an activity in the project Schedule is only completed when it satisfies the pre-defined exit criteria. For Schedule control across projects, milestones are used. Milestones are groups of outputs produced by a Project Team, that are inputs to processers owned by other Project Teams. Milestones then represent the key dependencies between Project Teams, and are the primary Schedule control tool at a program level.

Consider again Fig. 8, which identifies the following process streams:

(i) Workforce/training
(ii) Process
(iii) Testing/SW Control & Distribution
(iv) Venues/Infrastructure/Device Configuration & Logistics/Operations
(v) Application Development

Process streams are a string of processes typically assigned to a single Project Team. Where there is a link spanning one or more process streams, a milestone is defined to represent a dependency between Project Teams. Fig. 8 shows such milestones, indicated as Mn.

The activities and milestones can be entered into a suitable scheduling tool, such as the Primavera Project Planner where there are assigned start and end dates and owners. On complex programs, the scheduling tool needs to be able to produce multiple views of

activities and milestones. For Project Managers it needs to conveniently list the outputs (e.g. deliverables or services) and the resources required to produce them. For Program Managers the tool needs to list the milestones each project team is responsible for, together with the associated deliverables.

There is considerable advantage to forming a connection between significant process outputs and milestones in time. Firstly, attaching deliverables to milestones removes any ambuigity regarding whether a milestone has been achieved. Second, it identifies major cross-team dependencies, which will have a major cross-team impact in the event of schedule slippage. Additionally, being at a higher level than tasks/activities, it is easier for Program Managers to conduct a meaningful review of progress without having to become involved in the inner workings of individual project teams.

Although the invention has been described with reference to a large-scale sporting event (via, the Olympic Games), it is to be appreciated that it is equally applicable to any other field of endeavour. This can include the burgeoning field of e-business as much as more traditional manufacturing and construction enterprises.

The foregoing describes only a few embodiments of the invention, and modifications and/or changes can be made thereto without departing from the scope and spirit of the invention, the embodiments being illustrative and not restrictive.

We claim:

1. A framework for a build and operate program, comprising:

one or more build processes;

one or more operate processes;

one or more management processes; and

a plurality of links formed as outputs from said build, operate and management processes that form inputs to one or more other build, operate or management processes;

and wherein a said link has associated with it exit conditions that must be satisfied before the link can be traversed from output to input.

2. The framework of claim 1, wherein said build processes precede said operate processes, with an overlapping boundary therebetween such that some operate processes are able to be executed before all build processes are executed.

3. The framework of claim 2, wherein sequentially linked build and operate processes are assigned to one of a plurality of prescribed process streams, and wherein links spanning across two or more process streams form planning milestones so far as the outputs represented by the link are concerned.

4. The framework of claim 3, wherein each management process is linked only to either a build process or an operate process.

5. The framework of claim 1, wherein said exit conditions represent deliverable products or services that have been agreed to be provided.

6. A framework for a large-scale sporting event, comprising:

a set of build processes generally followed by a set of testing processes, generally followed by a set of operations processes, generally followed by a set of game-day processes;

a set of management processes related to all of said build, testing, operations, and

game-day sets of processes;

a plurality of links formed as outputs from individual build, test, operate, game-day, and management processes that form inputs to one or more other build, test, operate, game-day, and management processes; and

wherein said link has associated with it exit conditions that must be satisfied before the link can be traversed from output to input.

7. The framework of claim 6, wherein sequentially linked build and operate processes are assigned to one of a plurality of prescribed process streams, and wherein links spanning across two or more process stream form planning milestones so far as the outputs represented by the link are concerned.

8. The framework of claim 7, wherein each management process is linked only to either a build process or an operate process.

9. The framework of claim 6, wherein said exit conditions represent deliverable products or service levels that have been agreed to be provided.

10. A method for establishing a build and operate program, comprising the steps of:

defining one or more build processes;

defining one or more operate processes;

defining one or more management processes;

forming a plurality of links as outputs from said build, operate, and management processes and inputs to one or more other build, operate, or management processes.

11. The method of claim 10, wherein said build processes precede said operate processes, with an overlapping boundary therebetween such that some operate processes are able to be executed before all build processes are executed.

12. The method of claim 11, wherein sequentially linked build and operate processes are assigned to one of a plurality of prescribed process streams, and wherein links

spanning across two or more process stream form planning milestones so far as the outputs represented by the link are concerned.

13. The method of claim 12, wherein each management process is linked only to either a build process or an operate process.

14. The method of claim 10, wherein said exit conditions represent deliverable products or service levels that have been agreed to be provided.

15. A method for executing a build and operate program, comprising the steps of:

defining one or more build processes;

defining one or more operate processes;

defining one or more management processes;

forming a plurality of links as outputs from said build, operate, and management processes and inputs to one or more other build, operate, or management processes; and

allowing a link to be traversed from output to input in the course of executing the program only if exit conditions associated with it are satisfied.

16. The method of claim 15, wherein said build processes precedesaid operate processes, with an overlapping boundary therebetween such that some operate processes are able to be executed before all build processes are executed.

17. The method of claim 16, wherein sequentially linked build and operate processes are assigned to one of a plurality of prescribed process streams, and wherein links spanning across two or more process stream form planning milestones events so far as the outputs represented by the link are concerned.

18. The method of claim 17, wherein each management process is linked only to either a build process or an operate process.

19. The method of claim 15, wherein said exit conditions represent deliverable

products or service levels that have been agreed to be provided.

20. The method of claim 19, wherein said exit conditions are determined by the steps of:

beginning with an ultimate operate process, determining what requirements should be met to perform that process, defining exit criteria for immediately preceding processes, and continuing to progressively determine requirements for preceding processes to determine exit criteria for each said process, said exit criteria required to be satisfied before a link between processes can be traversed.

21. A method for executing a large-scale sporting event, comprising the steps of:

defining a set of build processes generally followed by a set of testing processes, generally followed by a set of operations processes, generally followed by a set of game-day processes;

defining a set of management processes related to all of said build, testing, operations, and game-day processes;

forming a plurality of links as outputs from individual build, test, operate, game-day, and management processes; and

allowing a link to be traversed from output to input in the course of executing the program only if exit conditions associated with it are satisfied.

22. A method for executing a build and operate program, comprising the steps of:

determining program requirements;

defining build, operate, and management processes, and related links therebetween, based on said requirements, said links between processes only being traversable if exit conditions associated with each are satisfied; and

traversing said processes over time.

23. The method of claim 22, wherein said requirements include deliverable products and service levels.

24. A method for executing a build and operate program comprising the steps of:

determining program requirements;

defining build, operate, and management processes, and related links therebetween, based on said requirements;

beginning with an ultimate operate process, determining what requirements should be met to perform that process defining exit criteria for immediately preceding processes and continuing to progressively determine requirements for each preceding process to determine exit criteria for each said process, said exit criteria required to be satisfied before a link between processes can be traversed; and

traversing said processes over time.

25. The method of claim 24, wherein said requirements include deliverable products and service levels.

26. A method for executing a build and operate program, comprising the steps of:

beginning with an ultimate operate process, determining what requirement should be met to perform that process, defining exit criteria for immediately preceding processes, and continuing to progressively determine requirements for preceding processes to determine exit conditions for each said process, said exit criteria required to be satisfied before a link between processes can be traversed.

27. The method of claim 26, wherein said exit conditions include deliverable products or service levels.

28. The method of claim 27, wherein said processes include build, operate, and management processes.

ABSTRACT

Frameworks and methods for executing large-scale build and operate programs, such as sporting events, and particularly an Olympic Games. A framework of interlinked build, operate, and management processes is formed in accordance with the program requirements, which are specified in terms of deliverable products or service levels. Links between individual processes can only be traversed when exit criteria are satisfied. Methodologies are described that can be used to determine the exit criteria. Once a framework is established, a schedule control plan, by way of significant milestones, is determined. The milestones are chosen to correspond with links between processes that span process streams or project teams.

Docket No. JP920000171US1

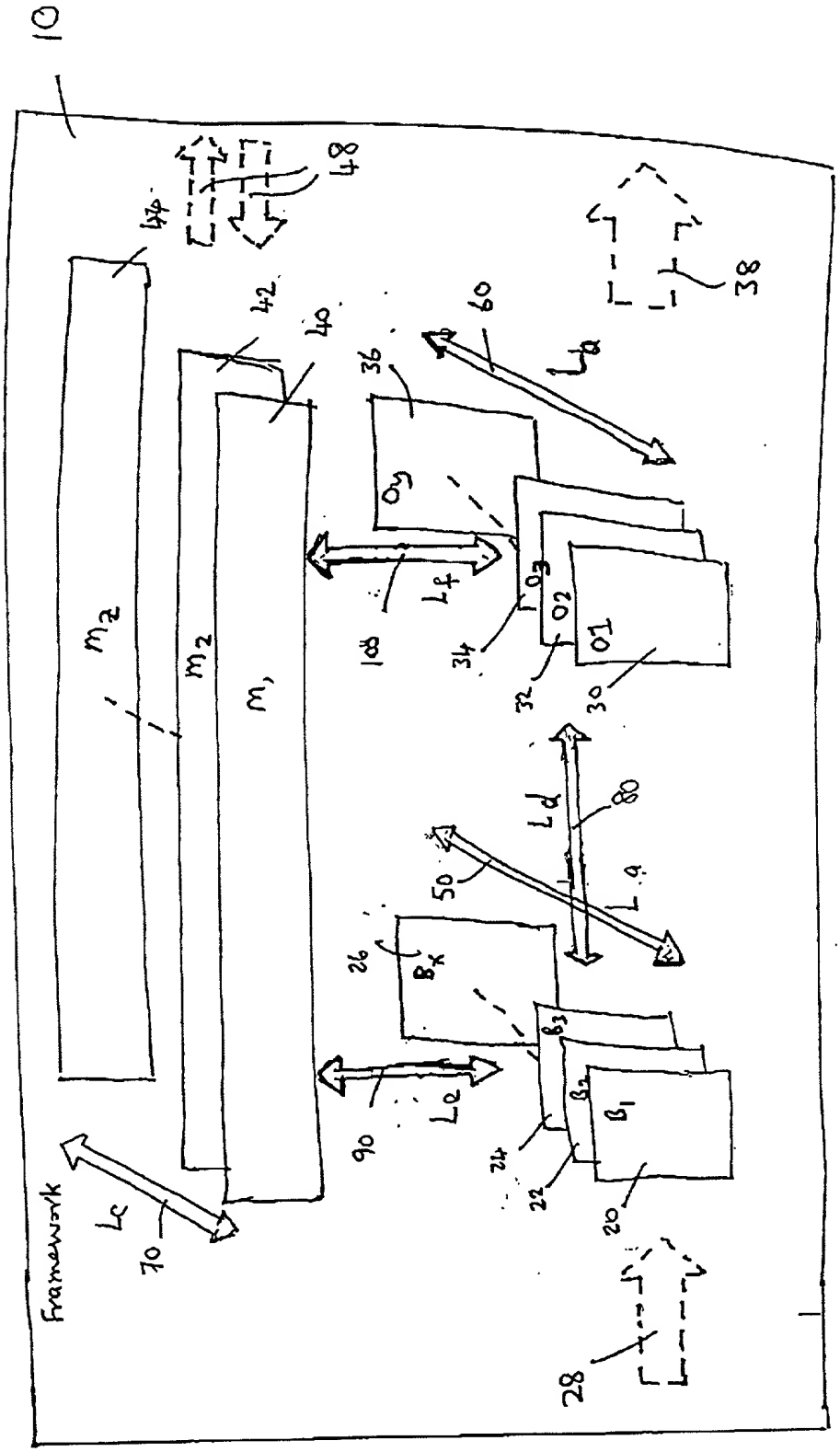
10
48
46
42
40
38
60
L_6
36
O_3
L_4
34
O_2
O_1
32
30
m_2
m_2
m_1
L_d
80
50
L_4
26
B_K
B_3
B_2
B_1
90
L_2
24
22
20
Framework
L_c
70
28

Fig. 1

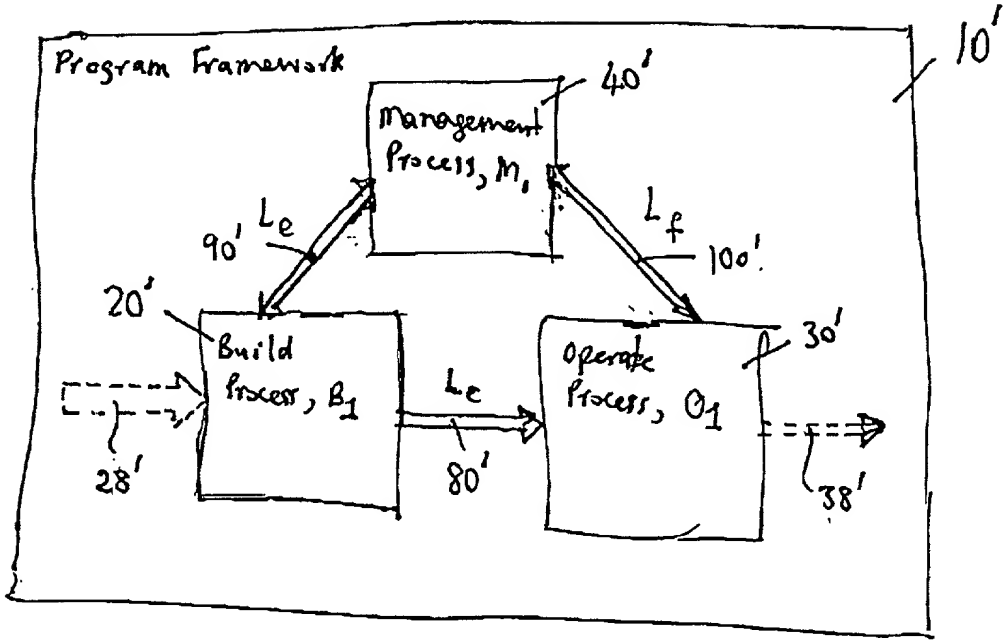
Program Framework
10'
Management Process, M_1
40'
L_e
90'
L_f
100'
20'
Build Process, B_1
Operate Process, O_1
30'
L_e
28'
80'
38'

Fig. 2

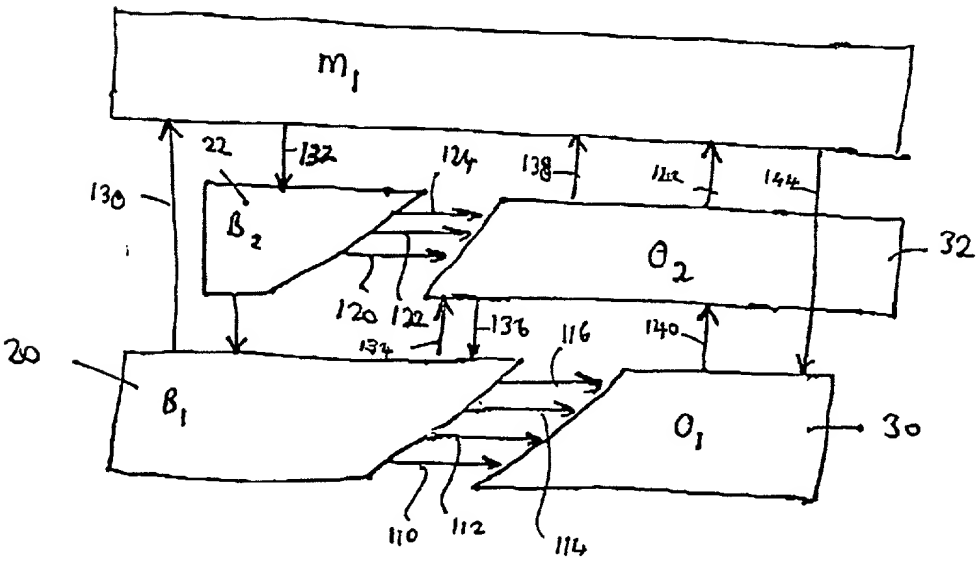
M_1
22
132
124
138
142
144
130
B_2
O_2
32
120
122
136
116
140
134
20
B_1
O_1
30
110
112
114

Fig. 3

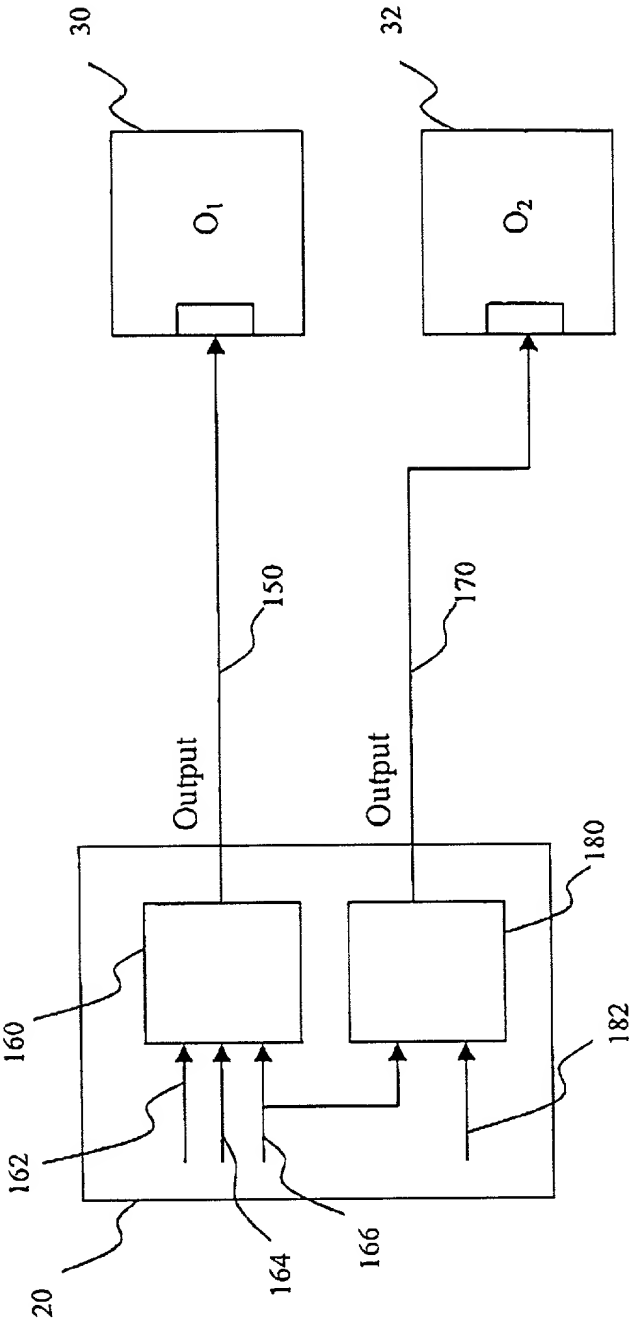

Fig. 4

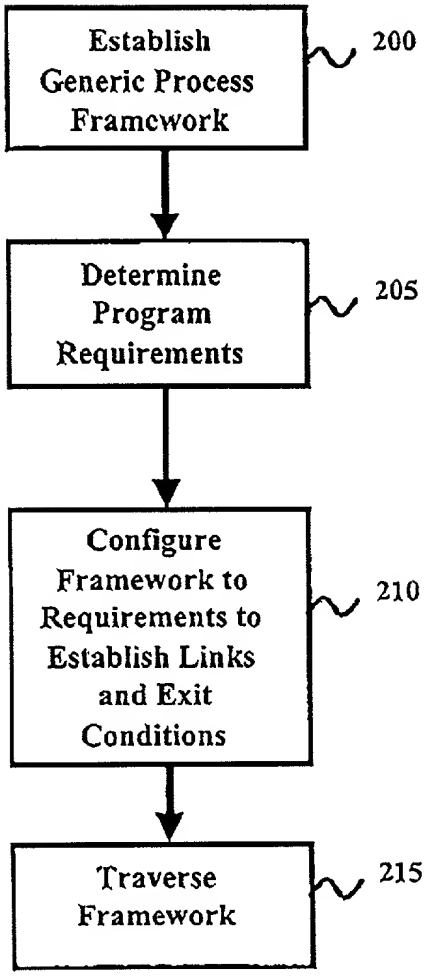
Establish Generic Process Framework
200
Determine Program Requirements
205
Configure Framework to Requirements to Establish Links and Exit Conditions
210
Traverse Framework
215

FIG. 5A

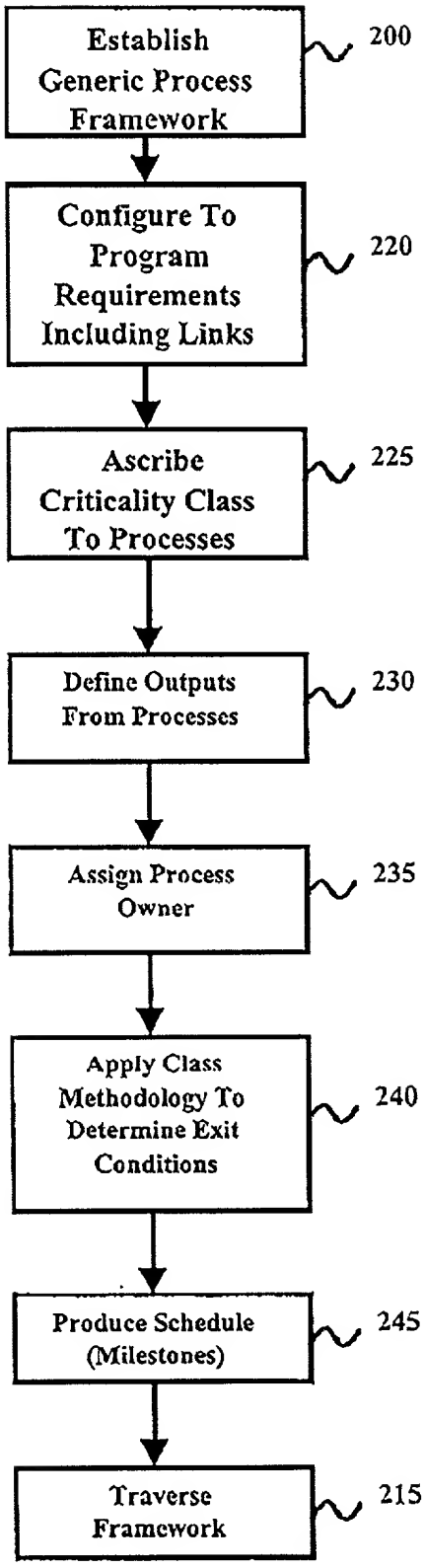

FIG. 5B

Docket No. JP920000171US1

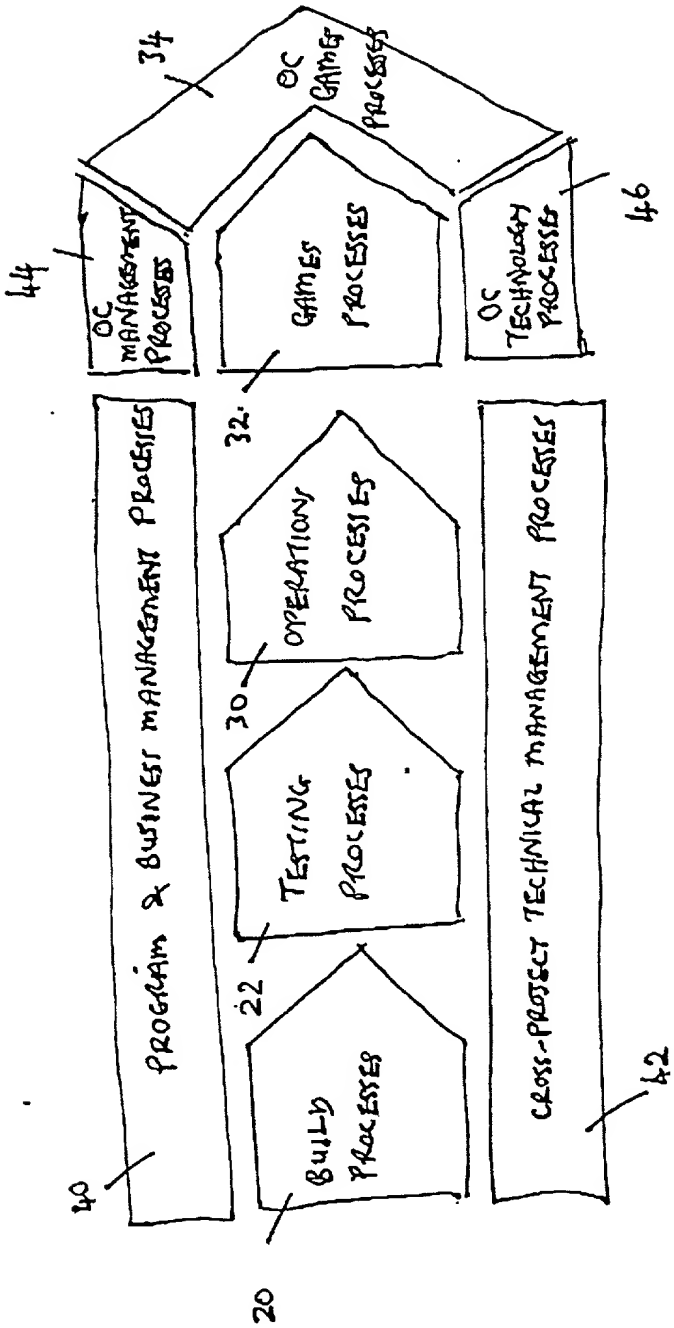
20
40
PROGRAM & BUSINESS MANAGEMENT PROCESSES
22
BUILD PROCESSES
30
TESTING PROCESSES
32
OPERATIONS PROCESSES
42
CROSS-PROJECT TECHNICAL MANAGEMENT PROCESSES
44
OC MANAGEMENT PROCESSES
34
OC GAMES PROCESSES
GAMES PROCESSES
46
OC TECHNOLOGY PROCESSES

Fig. 6

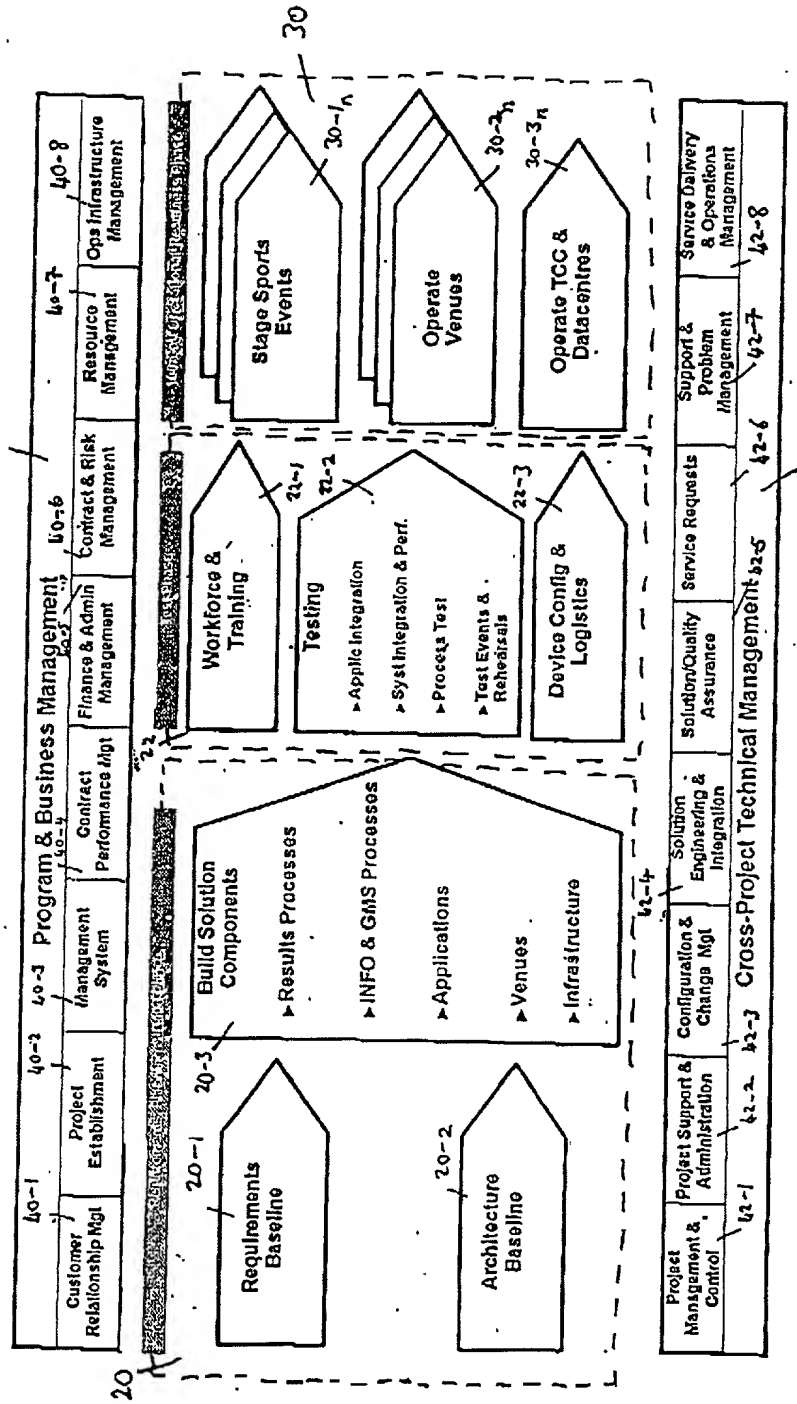
40
40-1
Customer Relationship Mgt
40-2
Project Establishment
40-3
Management System
40-4
Contract Performance Mgt
40-5
Finance & Admin Management
40-6
Contract & Risk Management
40-7
Resource Management
40-8
Ops Infrastructure Management
Program & Business Management
30
Stage Sports Events
30-1n
Operate Venues
30-2n
Operate TCC & Datacentres
30-3n
22
Workforce & Training
22-1
Testing
22-2
▸Applic Integration
▸Syst Integration & Perf.
▸Process Test
▸Test Events & Rehearsals
Device Config & Logistics
22-3
20
Requirements Baseline
20-1
Architecture Baseline
20-2
Build Solution Components
20-3
▸Results Processes
▸INFO & GMS Processes
▸Applications
▸Venues
▸Infrastructure
42-4
Solution Engineering & Integration
Solution/Quality Assurance
Service Requests
42-5
42-6
Support & Problem Management
42-7
Service Delivery & Operations Management
42-8
42
Project Management & Control
42-1
Project Support & Administration
42-2
Configuration & Change Mgt
42-3
Cross-Project Technical Management

Fig-7.

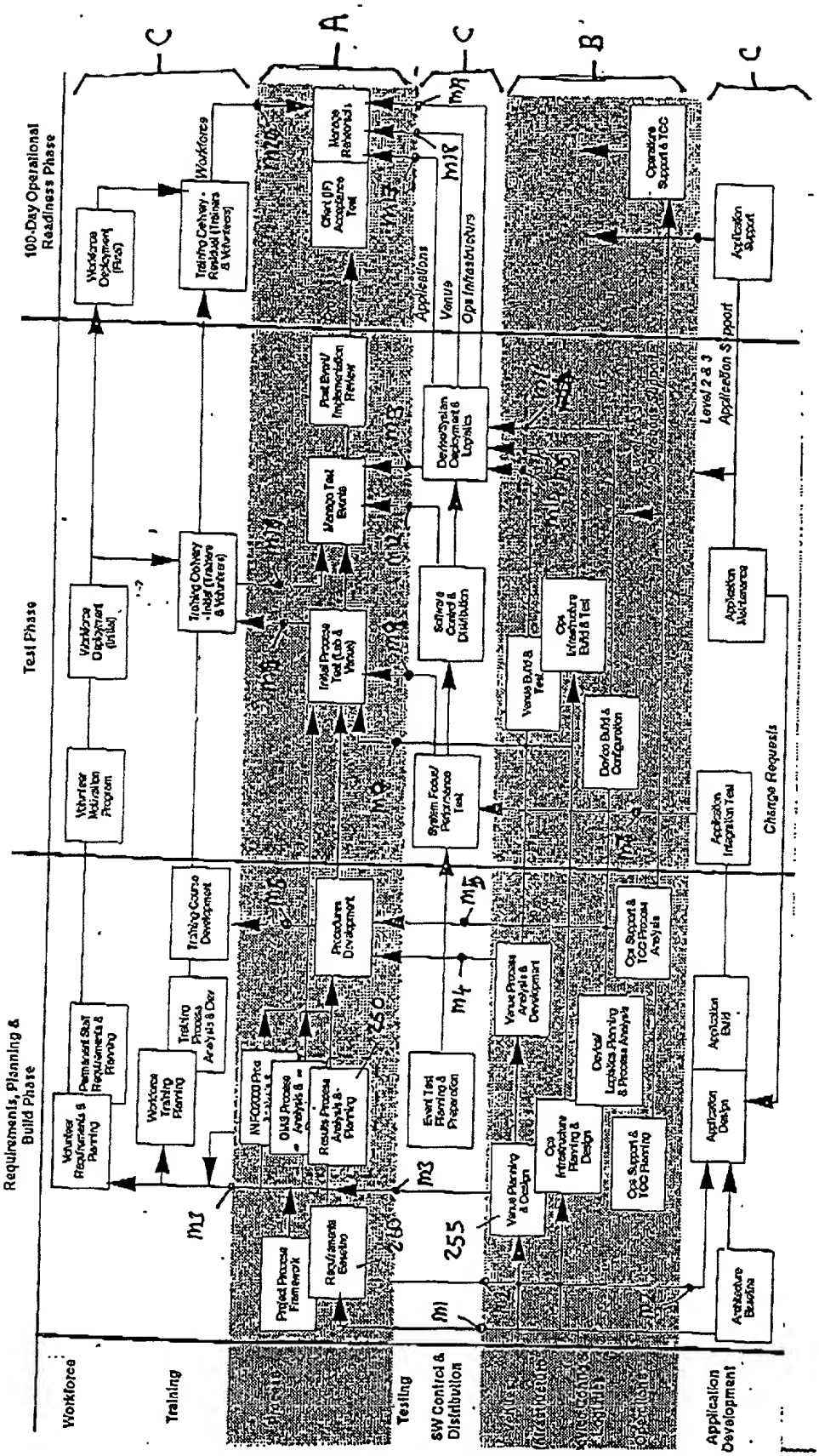
Requirements, Planning & Build Phase
Test Phase
100-Day Operational Readiness Phase
Workforces
Training
Testing
S/W Control & Distribution
Application Development
Applications
Venue
Ops Infrastructure
Level 2 & 3 Application Support
Change Requests
Workforce Requirements & Planning
Permanent Staff Requirements & Planning
Workforce Training Planning
Training Process Analysis & Dev
Training Course Development
Workforce Deployment (Plan)
Workforce Deployment (Build)
Workforce Motivation Program
Training Delivery - Initial (Trainers & Volunteers)
Training Delivery - Residual (Trainers & Volunteers)
Project Process Framework
Requirements Elicitation
Results Process Analysis & Planning
Old Process Analysis & ...
Procedure Development
Event Test Planning & Preparation
Venue Planning & Design
Ops Infrastructure Planning & Design
Central Logistics Planning & Process Analysis
Ops Support & TCC Planning
Ops Support & TCC Process Analysis
Venue Process Analysis & Development
Application Design
Application Build
Application Integration Test
Application Maintenance
Application Support
Architecture Baseline
System Focus/ Performance Test
Initial Process Test (Lab & Venue)
Manage Test Beds
Software Control & Distribution
Deploy/System Deployment & Logistics
Venue Build & Test
Ops Infrastructure Build & Test
Deploy Build & Configuration
Post Enroll Implementation Review
Client (IF) Acceptance Test
Manage Resources
Operations Support & TCC
M1
M2
M3
M4
M5
M7
M8
M9
M10
M11
M12
M13
M14
M15
M16
M17
M18
A
B
C
250
255
260

Fig. 8

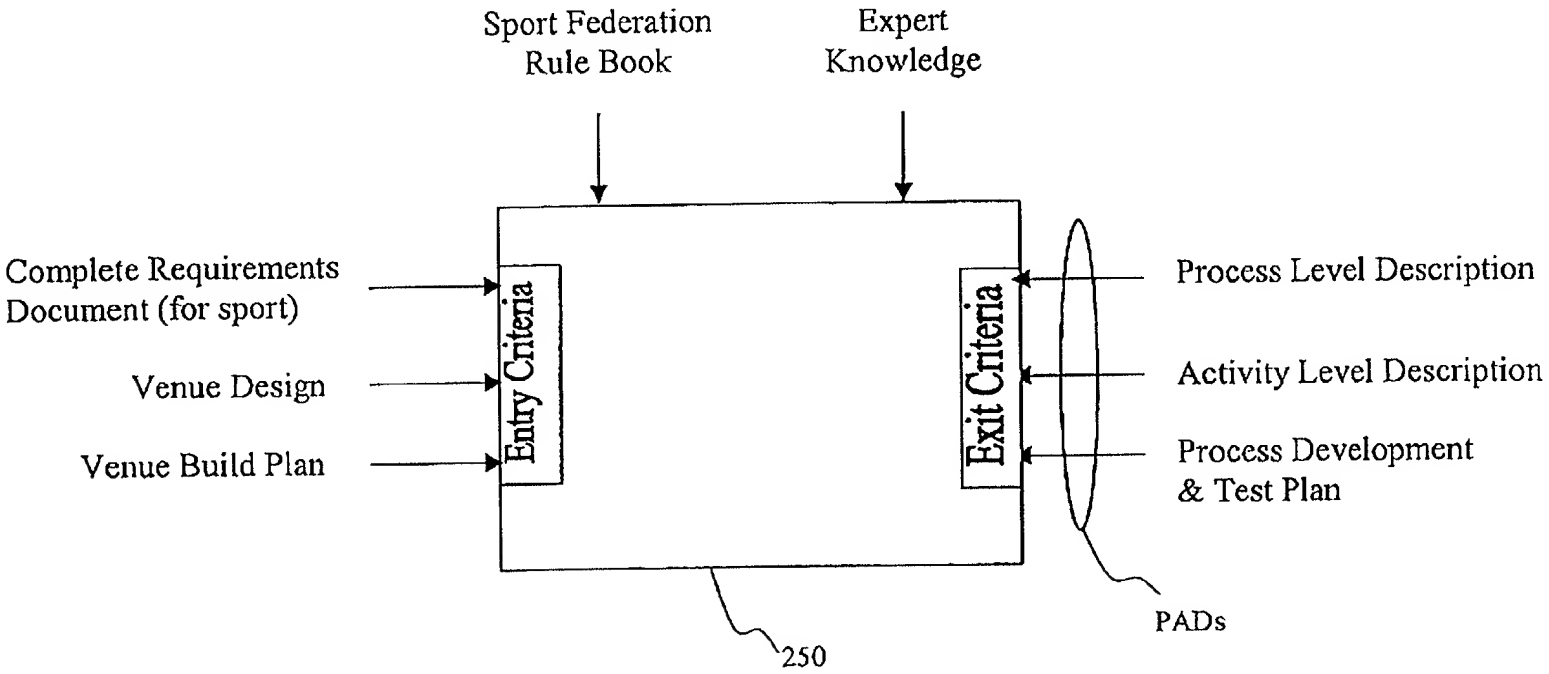

Fig. 9

09657497 .090800

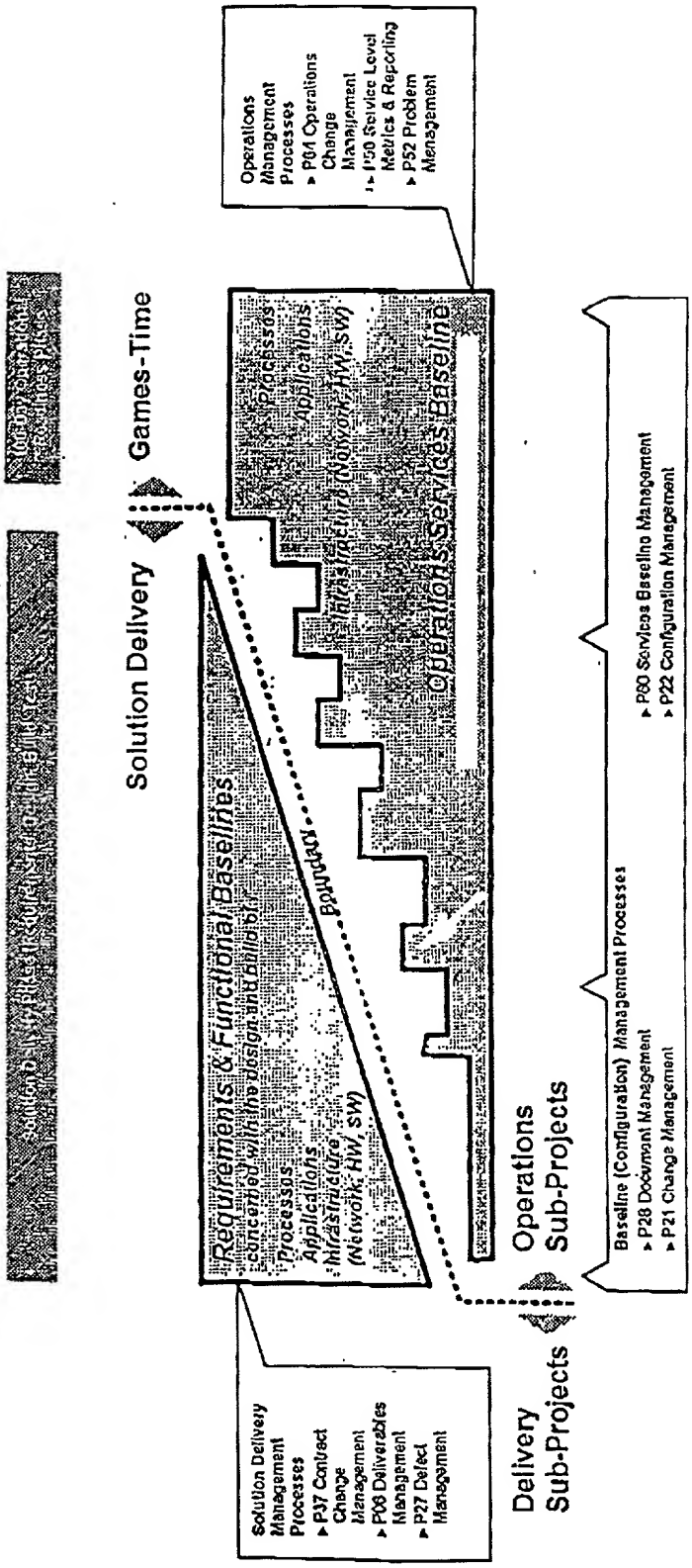
Solution Delivery
Games-Time
Requirements & Functional Baselines
Concerned with the design and build of
Processes
Applications
Infrastructure
(Network, HW, SW)
Boundary
Infrastructure (Network, HW, SW)
Applications
Processes
Operations Services Baseline
Operations Management Processes
▸ P24 Operations Change Management
▸ P50 Service Level Metrics & Reporting
▸ P52 Problem Management
Solution Delivery Management Processes
▸ P37 Contract Change Management
▸ P26 Deliverables Management
▸ P27 Defect Management
Delivery Sub-Projects
Operations Sub-Projects
Baseline (Configuration) Management Processes
▸ P28 Document Management
▸ P21 Change Management
▸ P30 Services Baseline Management
▸ P22 Configuration Management

Fig. 10

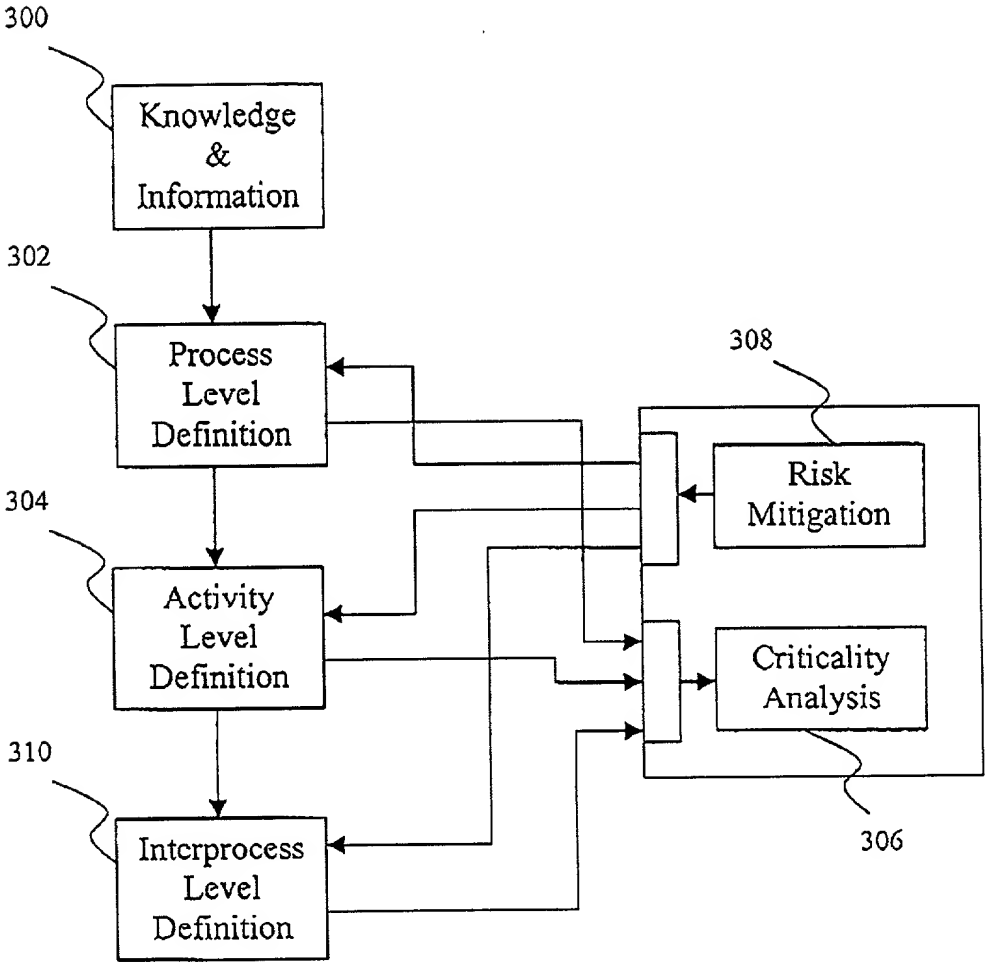
300
Knowledge & Information
302
Process Level Definition
304
Activity Level Definition
310
Interprocess Level Definition
308
Risk Mitigation
Criticality Analysis
306

Fig. 11

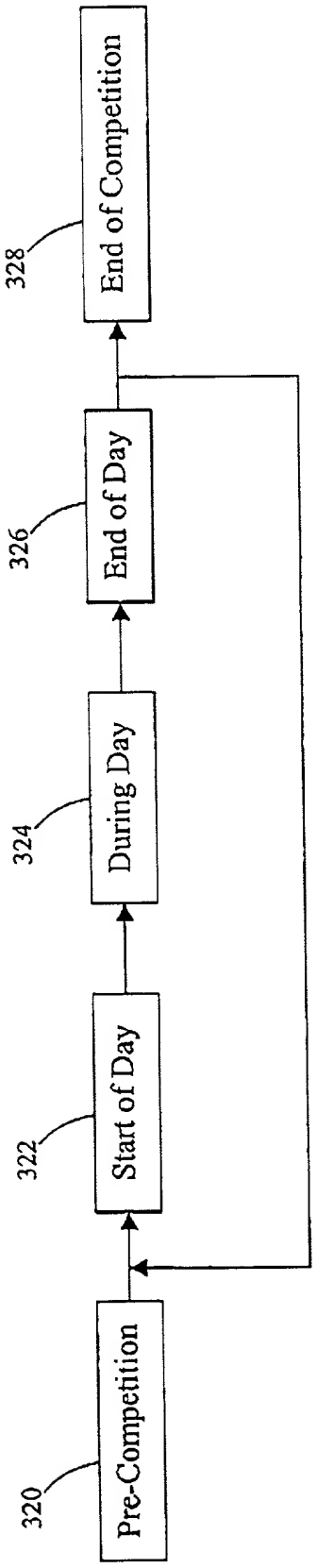
320
Pre-Competition
322
Start of Day
324
During Day
326
End of Day
328
End of Competition

Fig. 12A

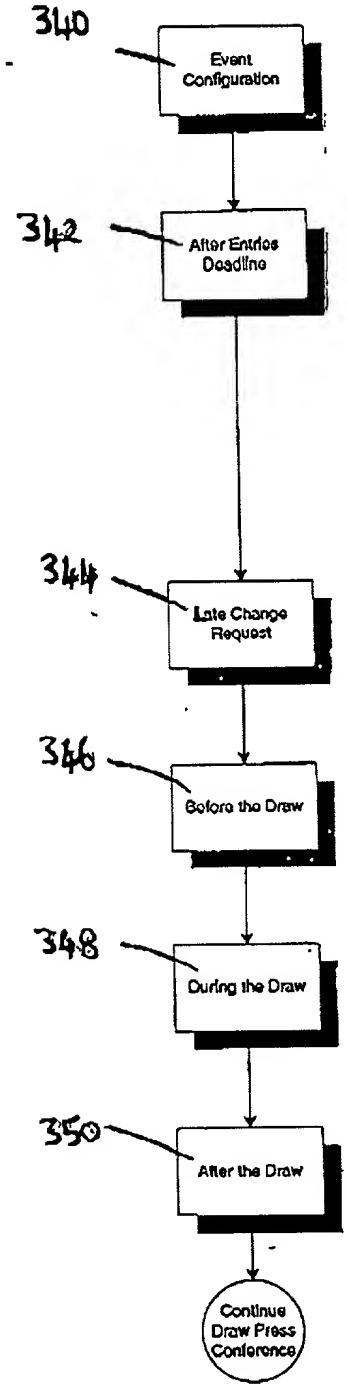

Fig. 12B

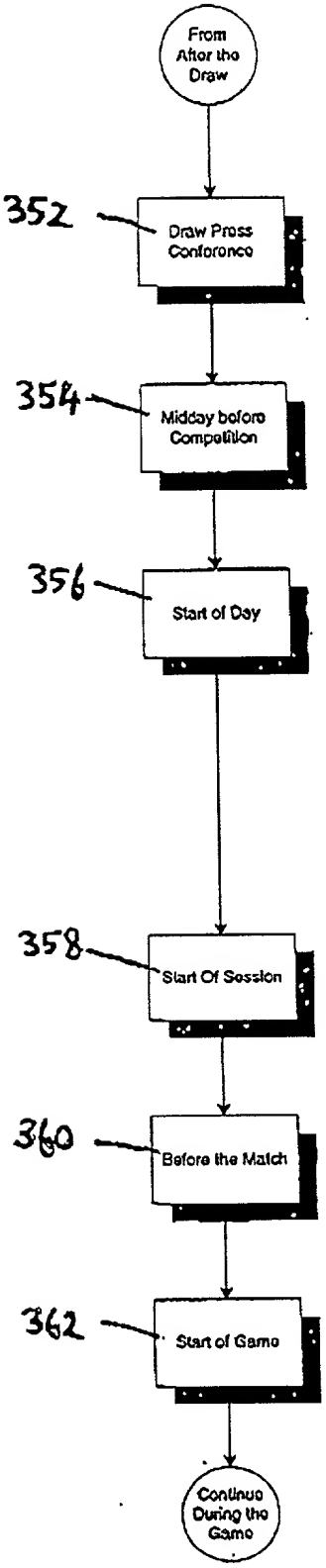

Fig. 12C

0000000000

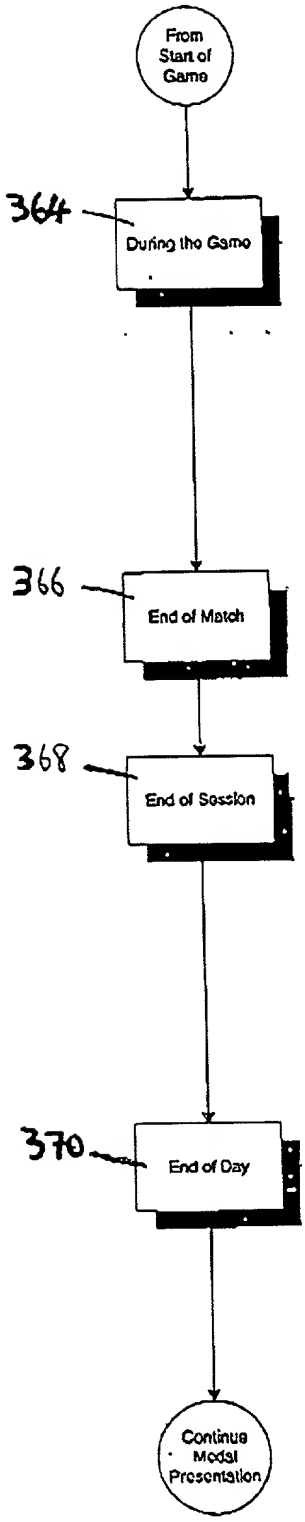

Fig. 12D

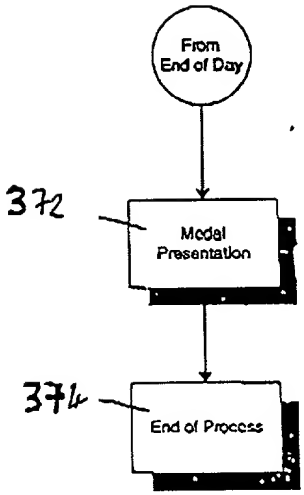

Fig. 12E

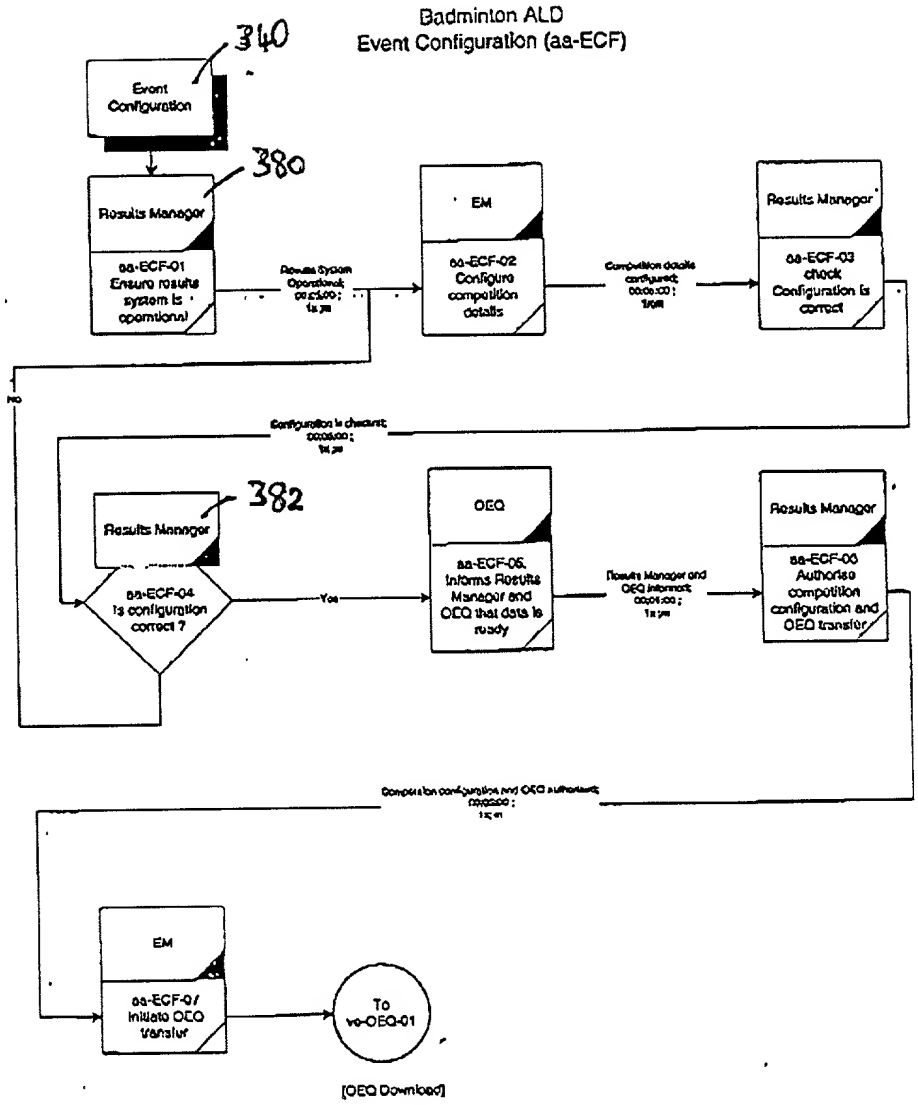
Badminton ALD
Event Configuration (aa-ECF)
340
Event Configuration
380
Results Manager
aa-ECF-01 Ensure results system is operational
EM
aa-ECF-02 Configure competition details
Results Manager
aa-ECF-03 check Configuration is correct
No
382
Results Manager
aa-ECF-04 Is configuration correct ?
Yes
OEQ
aa-ECF-05. Informs Results Manager and OEQ that data is ready
Results Manager
aa-ECF-06 Authorise competition configuration and OEQ transfer
EM
aa-ECF-07 Initiate OEQ transfer
To vo-OEQ-01
[OEQ Download]

Fig. 13

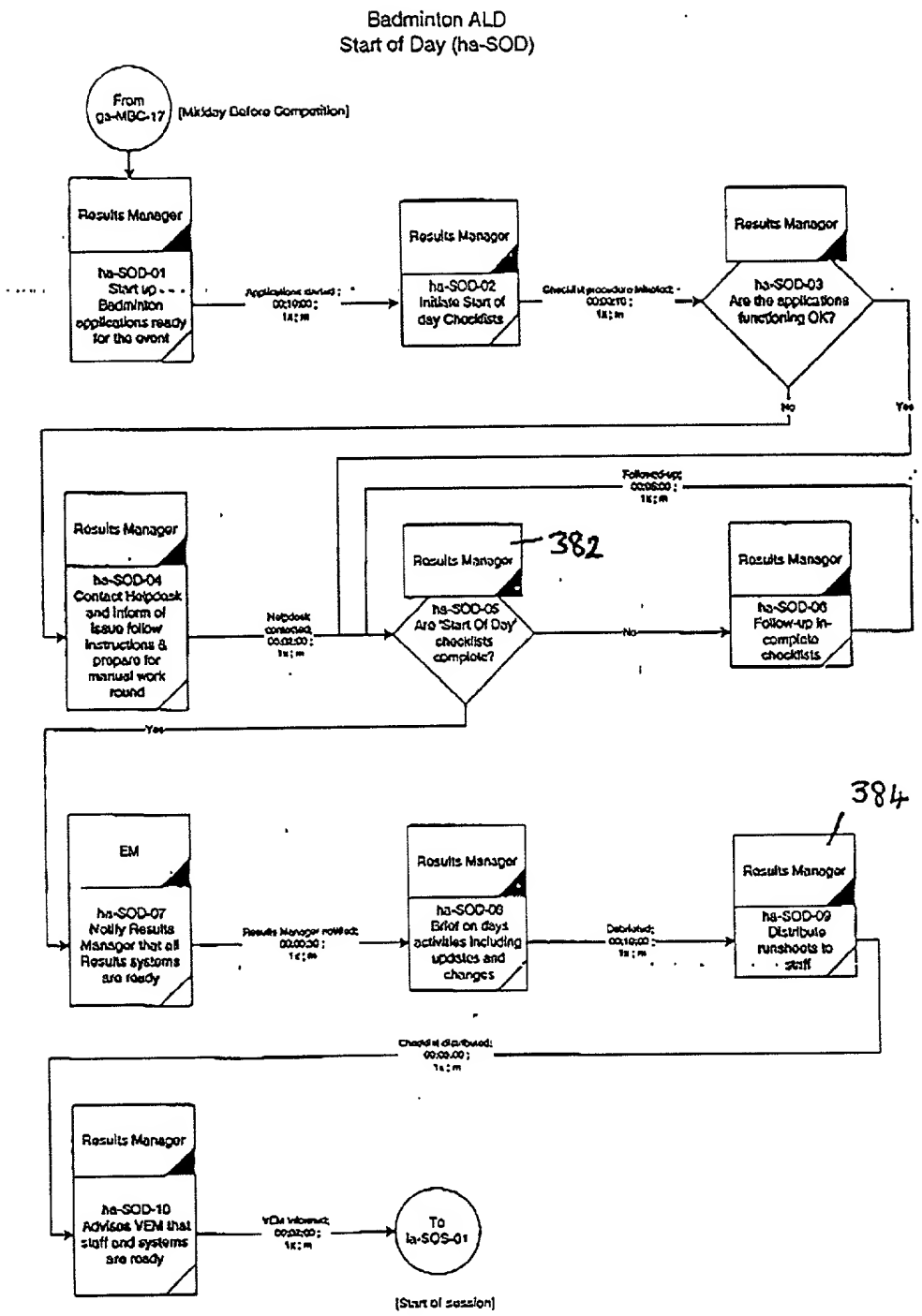
Badminton ALD
Start of Day (ha-SOD)
From ga-MBC-17
[Midday Before Competition]
Results Manager
ha-SOD-01 Start up Badminton applications ready for the event
Results Manager
ha-SOD-02 Initiate Start of day Checklists
Results Manager
ha-SOD-03 Are the applications functioning OK?
No
Yes
Results Manager
ha-SOD-04 Contact Helpdesk and inform of issue follow instructions & prepare for manual work round
Results Manager
ha-SOD-05 Are 'Start Of Day' checklists complete?
382
No
Results Manager
ha-SOD-06 Follow-up in-complete checklists
Yes
384
EM
ha-SOD-07 Notify Results Manager that all Results systems are ready
Results Manager
ha-SOD-08 Brief on days activities including updates and changes
Results Manager
ha-SOD-09 Distribute runsheets to staff
Results Manager
ha-SOD-10 Advise VEM that staff and systems are ready
To ia-SOS-01
[Start of session]

Fig. 14

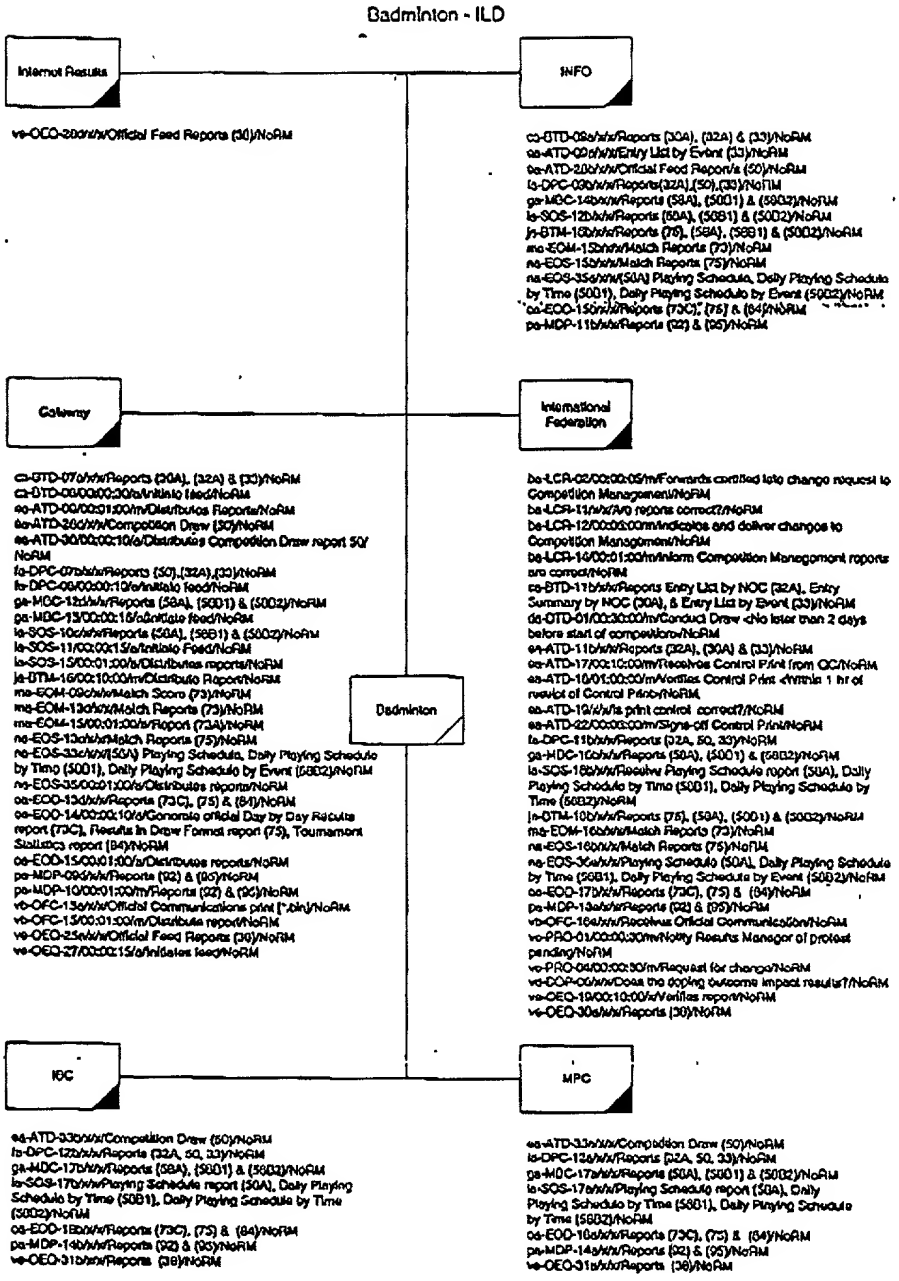
Badminton - ILD
Internet Results
INFO
Gateway
International Federation
Badminton
IOC
MPC

Fig. 15

ja-DTM-17/a/x/Contact PD - have report been received in PD?/NoRM
ja-DTM-19/00:01:00/m/Initiate Scoresheet print (6S)/NoRM
ja-DTM-20/00:05:00/a/Generate Print Control for Scoresheet print (6S)/NoRM
ja-BTM-22/00:05:00/m/Make Changes/NoRM
ja-BTM-25/00:00:15/m/Initiate Score Sheet report (6SA)/NoRM
ja-BTM-26/00:00:30/a/Generate Score Sheet report (6SA)/NoRM
ma-EOM-01/00:00:20/m/Initiate Match Reports Control Print (7S)/NoRM
ma-EOM-02/00:00:05/a/Generate Print for Control Match Report (7S)/NoRM
ma-EOM-02a/x/x/Control Print(7S)/NoRM
ma-EOM-07/00:01:00/m/Receives changes from Referee/NoRM
ma-EOM-09/00:01:00/m/Enter Match Score Changes into Results System/NoRM
ma-EOM-09/00:00:03/a/Captures updated Match Score into Results System/NoRM
ma-EOM-11/00:05:00/m/Receives Verified/Signed off Control Report from Referee ea/for end of match/NoRM
ma-EOM-12/00:00:30/m/Original Report filed in "Master Reports Folder" (With IF signed and time stamped)/NoRM
ma-EOM-13/00:00:15/m/Initiate feed (7S)/NoRM
ma-EOM-14/00:01:00/m/Verifies files received by Gateway and confirms the Distribution of the files/NoRM
na-EOS-01/00:00:20/m/Initiate Match Reports Control Print (7S)/NoRM
na-EOS-02/00:00:05/a/Generate Match Reports Control Print (7S)/NoRM
na-EOS-02a/x/x/Control Print (7S)/NoRM
na-EOS-07/00:01:00/m/Receives list of changes from Referee/NoRM
na-EOS-09/00:01:00/m/Enter Match Score Changes into Results System/NoRM
na-EOS-09/00:00:03/a/Captures updated Match Score into Results System/NoRM
na-EOS-11/00:02:00/m/Receives Verified Control Report from Referee/NoRM
na-EOS-12/00:00:30/m/Original Report filed in "Master Reports Folder" (With IF signed and time stamped)/NoRM
na-EOS-13/00:00:20/m/Initiate feed (7S)/NoRM
na-EOS-14/00:01:00/m/Verifies files received by Gateway and confirms the Distribution of the files/NoRM
na-EOS-15/00:01:00/a/Distributes match report (7S)/NoRM
na-EOS-16/00:05:00/m/Receives Court Assignments from Referee/NoRM
na-EOS-19/00:20:00/m/Enters Court Assignments into Results System/NoRM
na-EOS-20/00:00:03/a/Captures Court Assignments/NoRM
na-EOS-21/00:01:00/m/Initiate Daily Schedule Control Print (5A), (5801), (5802)/NoRM
na-EOS-22/00:00:05/a/Generate Print for Control Reports (5A), (5801), (5802)/NoRM
na-EOS-22a/x/x/Control Print (5A), (5801), (5802)/NoRM
na-EOS-23/00:05:00/m/Update changes as required/NoRM
na-EOS-30/00:15:00/m/Receives Verified Control Reports from Referee/NoRM
na-EOS-31/00:00:30/m/Original Report filed in "Master Reports Folder" (With IF signed and time stamped)/NoRM
na-EOS-32/00:00:10/m/Initiate official report: Playing Schedule (5A-1, Daily Playing Schedule by Time (5801), Daily Playing Schedule by Event (5802)/NoRM
na-EOS-33/00:00:10/a/Generate official daily schedule print report Playing Schedule (5A), Daily Playing Schedule by Time (5801), Daily Playing Schedule by Event (5802)/NoRM
na-EOS-34/00:01:00/m/Verifies files received by Gateway and confirms the Distribution of the files to PD/NoRM
oa-EOD-02/00:00:20/m/Initiates End of Day Reports Control Print Day by Day Results report (73C), Results in Draw Format report (7S), Tournament Statistics report (84)/NoRM
oa-EOD-03/00:00:05/a/Generates End of Day Reports Control Print Day by Day Results report (73C), Results in Draw Format report (7S), Tournament Statistics report (84)/NoRM
oa-EOD-03a/x/x/Reports (73C) (7S) (84)/NoRM
oa-EOD-09/00:05:00/m/Updates changes as required/NoRM
oa-EOD-11/00:01:00/m/Receives Approved End of Day Reports from Referee/NoRM
oa-EOD-12/00:00:30/m/Original Report filed in "Master Reports Folder" (Sign and time stamp)/NoRM
oa-EOD-13/00:00:15/m/Initiate official Day by Day Results report (73C), Results in Draw Format report (7S), Tournament Statistics report (84)/NoRM
oa-EOD-16/00:01:00/a/Verified files received by Gateway and confirms receipt of files with PD/NoRM
oa-EOD-19/a/a/Was the last match played a medal match?/NoRM
oa-EOD-20/00:01:00/m/Start end of day wrap-up/NoRM
pa-MDP-01/00:01:00/m/Initiate Models Presentation reports Medallist by Event report (92), Medal Standings report (95)/NoRM
pa-MDP-02/00:00:05/a/Generate Models Presentation Medallist by Event report (92), Medal Standings report (95)/NoRM
pa-MDP-02a/x/x/Reports (92) & (95)/NoRM
pa-MDP-07/00:05:00/m/Update changes as required/NoRM
pa-MDP-09/00:00:10/m/Initiate official reports Medallist by Event report (92), Medal Standings report (95)/NoRM
pa-MDP-12/00:01:00/a/Verifies files received by Gateway and confirm distribution of files. Contact PD informed release for reports and approval time/NoRM
va-BSV-01/00:00:30/m/Initiate report from (B) System/NoRM
va-BSV-02/00:00:30/a/Generate report print for control from (B) System/NoRM
va-BSV-09/00:05:00/m/Update highlight on (B) System/NoRM
va-BSV-10/00:00:00/a/Capture update (B) System/NoRM
vo-OFC-03/00:01:00/m/Receives decision in file format on diskette/NoRM
vb-OFC-04/00:00:30/a/Download file from diskette on Results System/NoRM
vb-OFC-05/00:01:00/m/Captures Official Communication/NoRM
vb-OFC-06/00:01:00/m/Converts Wordpro file (*.lwp) to a bin file (*.bin)/NoRM
vb-OFC-07/00:00:05/a/Initiates Official Communications print (*.bin)/NoRM
vb-OFC-08/00:01:00/a/Generates Official Communications print (*.bin)/NoRM
vb-OFC-08a/x/x/Official Communications print (*.bin)/NoRM
vb-OFC-09/00:05:00/m/Verifies reports/NoRM
vb-OFC-10/x/x/x Print for Control Correct?/NoRM
vb-OFC-11/00:05:00/m/Make Corrections/NoRM
vb-OFC-13/00:00:15/m/Initiate Feed/NoRM
vb-OFC-14/00:01:00/m/Verifies files received by Gateway and confirms the Distribution of the files/NoRM
vo-PRO-06/00:05:00/m/Makes changes/NoRM

vo-OEO-02/00:05:00/m/Verify that all the NOC codes have been entered into the software/NoRM
vo-OEO-03/00:02:00/m/Create 'importDD' folder on EM/NoRM
vo-OEO-04/00:01:00/m/Go to the Gateway and create a drive that points to the new folder that you have just created./NoRM
vo-OEO-05/00:02:00/m/Use 'Venue Download' application on the Gateway/NoRM
vo-OEO-06/00:02:00/m/Enter parameters/NoRM
vo-OEO-08/x/x/Were the CR & IS files downloaded into the nominated 'importDD' folder?/NoRM
vo-OEO-09/00:02:00/m/Save a copy of the original import DD file received from CR&IS/NoRM
vo-OEO-11/00:05:00/m/Reload Database #3/NoRM
vo-OEO-15/00:05:00/m/Reload Database #3/NoRM
vo-OEO-16/00:05:00/m/Reload database #1/NoRM
vo-OEO-17/00:00:15/m/Initiate Print for Control Entry Data Checklist (30)/NoRM
vo-OEO-18/00:01:00/a/Generate Print for Control Report (30)/NoRM
vo-OEO-20/00:00:00/m/Advise TCC of all changes made to date/NoRM
vo-OEO-23/00:00:30/m/File Original Report in "Master Reports Folder" (With IF sign and time stamp)/NoRM
vo-OEO-25/00:00:15/m/Initiate Local Distribution copies Entry Data Checklist (30)/NoRM
vo-OEO-26/00:00:30/m/Verifies Files received by Gateway Operator and confirms the Distribution of the files/NoRM
vo-OEO-29/00:00:30/m/Verify files received by print distribution and confirm the distribution of the file./NoRM
vo-OEO-32/00:05:00/m/Deliver copies to Clients/NoRM

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Fig. 16A

Badminton - ILD

aa-ECF-02/00:05:00/a/Configure competition details/NoRM
aa-ECF-07/asap/x/Initiate OEQ transfer/NoRM
ab-AED-06/00:10:00/m/Update system with ranking/ national ranking and sending information <Results Manager or Lead Tester completes task>/NoRM
ab-AED-07/00:00:05/a/Capture ranking/national ranking and sending information/NoRM
ab-AED-08/00:00:15/m/Initiate Entries Summary by NOC (30A), Entry List by NOC (32A), Entries, Entry List by Event (33) <No more than 24 hrs after the deadline> <Results Manager or Lead Tester completes task>/NoRM
ab-AED-09/00:00:10/a/Generate reports (30A, 32A, 33) <No later than 24 hrs after the deadline> <Results Manager or Lead Tester completes task>/NoRM
ab-AED-9a/x/x/Reports 30A, 32A, 33 <Results Manager or Lead Tester completes task>/NoRM
ab-AED-10/00:30:00/m/Enter Changes into Results System/ NoRM
ab-AED-10/00:05:00/m/Receives and files in "Master Reports Folder" (with IF sign and time stamp)/NoRM
ba-LCR-05/00:10:00/m/Enters and captures changes into Results System/NoRM
ba-LCR-07/00:05:00/a/Initiate print for control revised reports: Entries Summary by NOC (30A), Entry List by NOC (32A) Entry List by Event (33)/NoRM
ba-LCR-00/00:00:20/a/Generate print for control reports (30A), (32A),(33)/NoRM
ba-LR-08a//Reports (30A), (32A) & (33)/NoRM
ca-STD-01/00:05:00/m/Initiate reports Entry List by NOC (32A), Entry Summary by NOC (30A), & Entry List by Event (33), Quality Assurance Checklist (30)/NoRM
ca-STD-02/00:00:30/a/Generate Print for Control (reports 30A, 32A, 33, 30)/NoRM
ca-STD-04/x/x/Is Print for Control Correct?/NoRM
ca-STD-05/00:05:00/m/Make Corrections/NoRM
ca-STD-07/00:00:15/m/Initiate feed/NoRM
ca-STD-10/00:01:00/m/Verify files received by Print Distribution and confirm the Distribution of the files/NoRM
ea-ATD-01/00:00:10/m/Receives Draw List from Results Manager/NoRM
ea-ATD-02/x/x/Were there changes to the entry lists during the draw?/NoRM
ea-ATD-03/00:05:00/m/Update / capture changes/NoRM
ea-ATD-06/00:00:10/m/Initiate pre-draw reports (30A, 32A, 33, 38)/NoRM
ea-ATD-07/00:00:10/a/Re-generated official / authorised reports (30A, 32A, 33, 38)/NoRM
ea-ATD-08/00:00:10/m/Verifies received by Gateway and confirms the Distribution of the files/NoRM
ea-ATD-10/00:00:30/m/Inform PD: Reports (32A), (30A) & (33) are "corrected" and have been distributed and approval time; Inform INFO "corrected" version of report 33 (Entry List by event) has been redistributed/NoRM
ea-ATD-12/00:30:00/m/Enter Draw Results into Results System/ NoRM
ea-ATD-13/00:00:03/a/Capture Draw Results/NoRM
ea-ATD-14/00:10:00/m/Initiate Competition Draw Control Print (50)/NoRM
ea-ATD-15/00:00:30/a/Generate Competition Draw Control Print (50)/NoRM
ea-ATD-21/00:05:00/m/Make Corrections/NoRM
ea-ATD-26/00:00:15/m/(Notes approval time) Initiate draw report 51/NoRM
ea-ATD-27/00:00:10/a/Generate official draw report 51/NoRM
ea-ATD-28/00:00:15/m/Verifies files received by Gateway and confirms the Distribution of the files/NoRM
ea-ATD-31/00:00:30/m/Contact PD - advise release for report 50, and approval time/NoRM

fa-DPC-01/00:00:15/m/Initiate Print for Control Competition Draw report (50),Entry List by NOC (32A),Entry List by Event (33)/NoRM
fa-DPC-02/00:00:30/a/Generate Print for Control report (50),(32A),&(33)/NoRM
fa-DPC-04/x/x/Is Print for Control Correct?/NoRM
fa-DPC-05/00:05:00/m/Make Corrections/NoRM
fa-DPC-07/00:00:30/m/Initiate feed/NoRM
fa-DPC-10/00:01:00/m/Verify files received by print distribution and confirm Distribution/NoRM
ga-MBC-03/00:30:00/m/Receives Court Assignments from Competition Management/NoRM
ga-MBC-04/00:20:00/m/Enters Court Assignments details into Results System/NoRM
ga-MBC-05/00:00:03/a/Captures Court Assignments/NoRM
ga-MBC-06/00:01:00/m/Initiate Daily playing schedules (reports 58A, 58B1, 58D2)/NoRM
ga-MBC-07/00:00:05/a/Generate print control reports (58A, 58B1, 58B2)/NoRM
ga-MBC-08/x/x/Are court assignments correct?/NoRM
ga-MBC-10/00:05:00/m/Makes changes/NoRM
ga-MBC-12/00:00:15/a/Initiate feed/NoRM
ga-MBC-15/00:01:00/m/Verify files received by Print Distribution and confirm distribution of files/NoRM
ia-SOS-01/00:05:00/m/Receive Officials Assignments from Referee/NoRM
ia-SOS-02/00:30:00/m/Enter Officials Assignments into Results System/NoRM
ia-SOS-03/00:00:03/a/Capture Officials Assignments/NoRM
ia-SOS-04/00:00:15/m/Initiate print for control, daily playing schedules reports 58A, 58B1 & 58B2/NoRM
ia-SOS-05/00:00:30/a/Generate Daily Schedule Control Print Playing Schedule report (58A), Daily Playing Schedule by Time (58B1), Daily Playing Schedule by Time (58B2)/NoRM
ia-SOS-05a/x/x/Locally print Control Print (58A), (58B) & (58C)/ NoRM
ia-SOS-00/00:05:00/m/Make Corrections/NoRM
ia-SOS-09/00:00:30/m/Original Report filed in "Master Reports Folder (With IF sign and time stamp)/NoRM
ia-SOS-10/00:00:15/m/Initiate Daily Schedule Control Print Playing Schedule report (58A), Daily Playing Schedule by Time (58B1), Daily Playing Schedule by Time (58B2)/NoRM
ia-SOS-13/00:01:00/m/Verifies files received by Gateway and confirms the Distribution of the files/NoRM
ia-SOS-14/00:02:00/m/Contact PD, advise release Playing Schedule report (58A), Daily Playing Schedule by Time (58D1), Daily Playing Schedule by Time (58D2), and approval times/ NoRM
ja-DTM-06/00:00:10/m/Select "walkover" option/NoRM
ja-DTM-07/00:00:10/a/Capture "walkover" option <completing task>/NoRM
ja-DTM-10/00:00:30/m/Initiate Results in Draw Format Report (75) and Playing Schedule report (58A), Daily Playing Schedule by Time (58D1) and Daily Playing Schedule by Time (58D2) for all events/NoRM
ja-DTM-11/00:00:30/a/Generate print for control Results in Draw Format Report (75)/NoRM
ja-DTM-11a/x/x/Reports (75), (58A), (58B1) & (58B2)/NoRM
ja-DTM-13/00:05:00/m/Update changes as required <VC/MSL completing task>/NoRM
ja-DTM-14/00:00:30/m/Initiate official Results in Draw Format Report (75) and Playing Schedule report (58), Daily Playing Schedule by Time (58B1) and Daily Playing Schedule by Time (58B2) <VC/MSL completing task>/NoRM
ja-DTM-15/00:00:30/a/Generate official Results in Draw Format Report (75) and Playing Schedule report (58), Daily Playing Schedule by Time (58B1) and Daily Playing Schedule by Time (58D2) <VC/MSL completing task>/NoRM

Fig. 16B

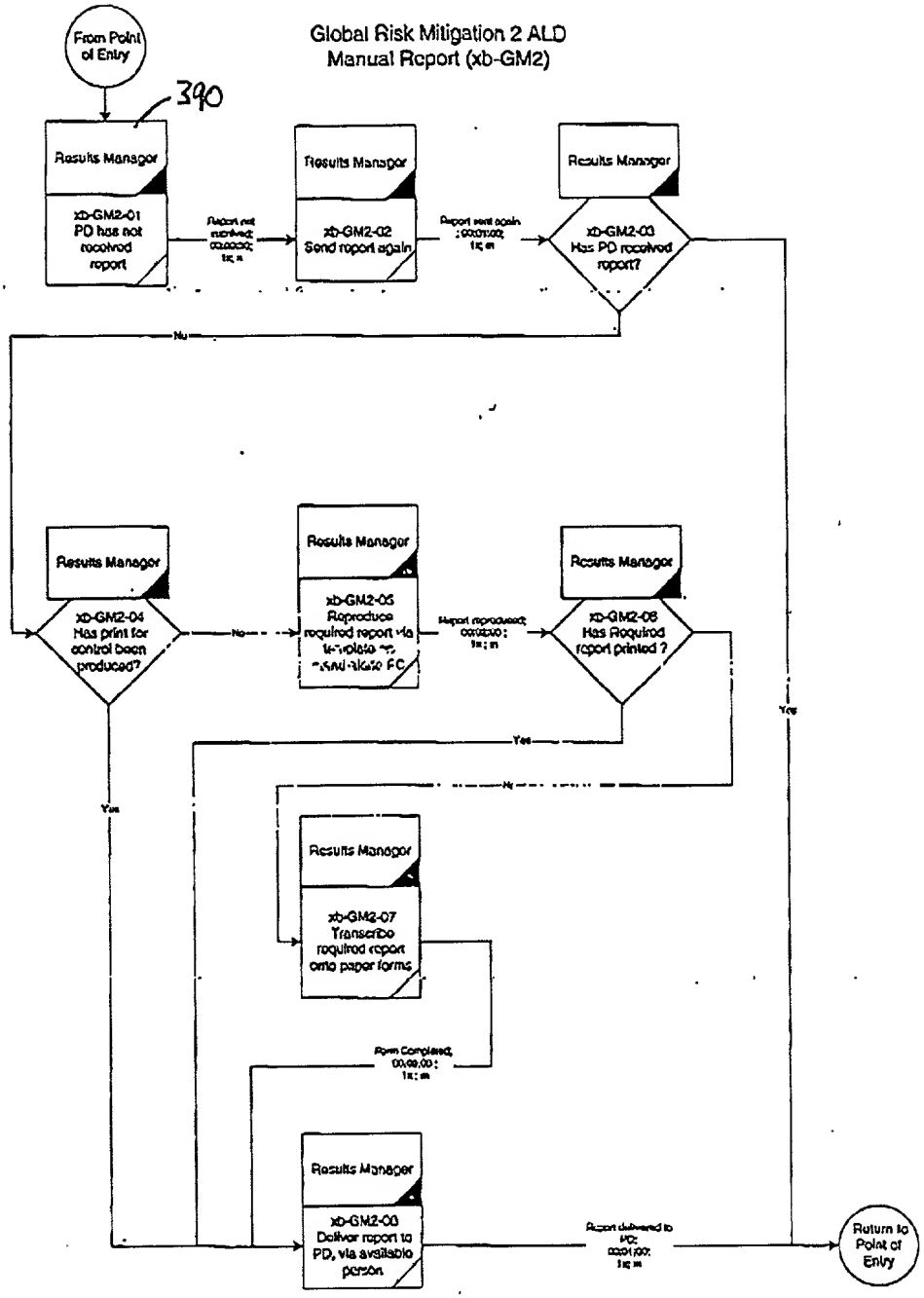
Global Risk Mitigation 2 ALD
Manual Report (xb-GM2)
From Point of Entry
390
Results Manager
xb-GM2-01 PD has not received report
Results Manager
xb-GM2-02 Send report again
Results Manager
xb-GM2-03 Has PD received report?
No
Yes
Results Manager
xb-GM2-04 Has print for control been produced?
No
Yes
Results Manager
xb-GM2-05 Reproduce required report via
Results Manager
xb-GM2-06 Has Required report printed ?
Yes
No
Results Manager
xb-GM2-07 Transcribe required report onto paper forms
Form Completed, 00:00:00 ; 1x ; m
Results Manager
xb-GM2-00 Deliver report to PD, via available person
Report delivered to PD; 00:01:00; 1x m
Return to Point of Entry

Fig. 17

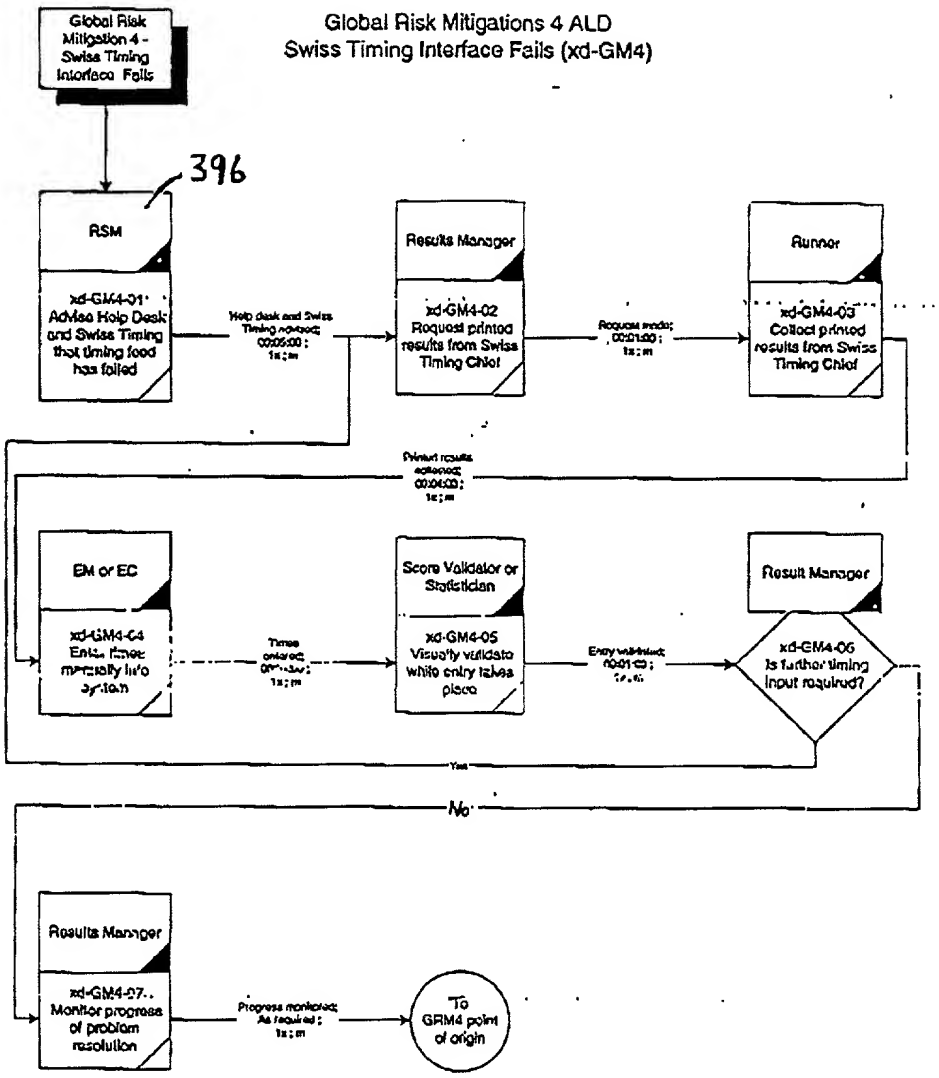

Fig. 18

US-9,390,399-B2

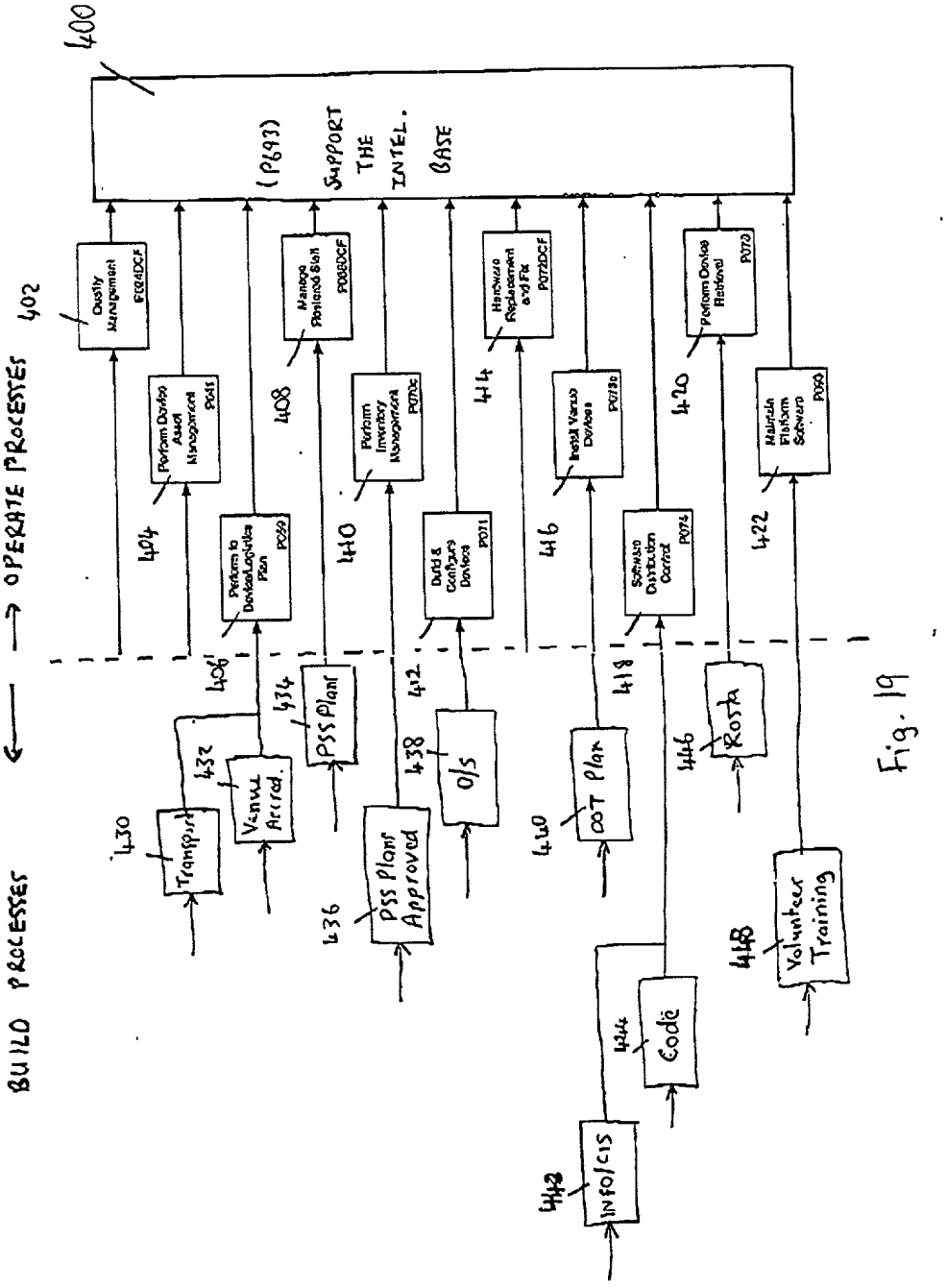
400
SUPPORT THE INTEL. BASE
(P693)
OPERATE PROCESSES
402
BUILD PROCESSES
Quality Management EE04DCF
Perform Device Asset Management PO45
Perform to Device Logistics Plan PO39
Manage Planned Risk PO85DCF
Perform Inventory Management PO76c
Build & Configure Devices PO71
Hardware Replacement & Fix PO72DCF
Install Various Devices PO73c
Software Distribution Control PO74
Perform Device Retrieval PO70
Maintain Platform Software PO90
404
406
408
410
412
414
416
418
420
422
430
432
434
436
438
440
442
444
446
448
Transport
Various Arrival
PSS Plan
PSS Plan Approved
O/S
COT Plan
Infosys
Code
Rosta
Volunteer Training

Fig. 19

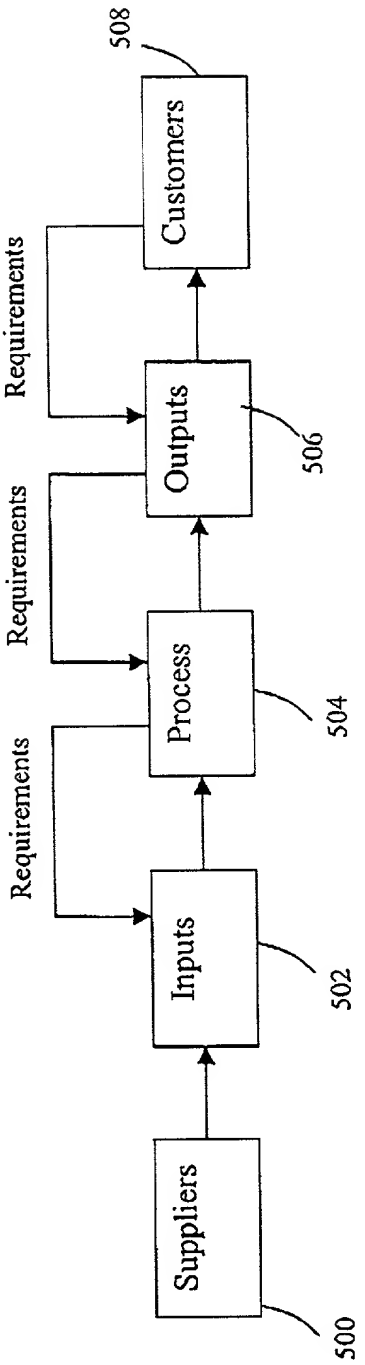
Suppliers
Inputs
Process
Outputs
Customers
Requirements
Requirements
Requirements
500
502
504
506
508

Fig. 20

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Date: September 8, 2000

S. J. Unite et al. Docket No.: JP920000171US1

Serial No.: Group No.:

Filed: Herewith Examiner:

For: BUILD AND OPERATE PROGRAM PROCESS FRAMEWORK AND EXECUTION

Assistant Commissioner for Patents
Washington, D.C. 20231

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